Mutual Aid and Common Frequencies Manual 2011

Montana Department of Administration
State Information Technology Services Division (SITSD)
Public Safety Services Bureau (PSSB)

PO Box 200113
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OFFICE OF THE GOVERNOR

STATE OF MONTANA

BRIAN SCHWEITZER
GOVERNOR

JOHN BOHLINGER
Lt. GOVERNOR

May 2011

To Montana's Public Safety Community:

Interoperable public safety communications are critical to the mission of not only protecting the safety of our citizens in Montana, but also the public safety responders who serve them. Enhanced interoperable communications is a key priority for the State of Montana. In fact, it is listed as the second goal in Montana's comprehensive State Preparedness Report, published by the Department of Military Affairs.

Montana and the nation are challenged to prepare for the impacts of a dramatically changing communications environment. Advanced communications technologies will help Montana prepare for the future and also assist in meeting Montana's public safety communications missions.

Great strides are being made to improve public safety radio and mobile data communications in Montana. The State of Montana is committed to the success of a statewide interoperable radio system that will meet the growing needs of first responders across Montana.

To that end, I am pleased to announce that new resources are being made available to the Montana response community, which relies heavily on Montana's Mutual Aid system. The State of Montana—in cooperation with fire, law enforcement and EMS Mutual Aid Oversight Councils—have added new frequencies and made significant changes to this fourth edition of the Mutual Aid and Common Frequencies Manual. These changes will allow local, tribal, and state stakeholders to better plan and execute effective voice and data communications.

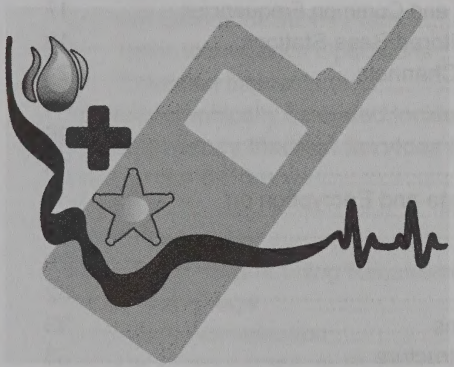
Montana has a proud history of providing assistance to local agencies during disasters or emergencies that might have overwhelmed local, county, regional or tribal resources. Any emergency response — large or small — depends on simple and effective communication. The State of Montana recognizes that nothing is more important than improving the safety of our citizens, neighbors and responders.

In that spirit, I want to applaud the commitment and hard work of those who are collaborating to enhance Montana's emergency communication operations.

Sincerely,

Brian Schweitzer
Governor

Mutual Aid and Common Frequencies Manual 2011



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Part I: General Information

Introduction

In Montana, we are all neighbors by necessity. Early frontier life was difficult, and pioneer neighbors often gathered together help each other with big jobs. Today, first responders still rely on cooperation to help neighboring jurisdictions during an emergency. Mutual aid is the voluntary sharing of personnel and resources to lend assistance across jurisdictional boundaries in response to an emergency that exceeds local resources, such as a disaster or a multiple alarm fire.

The Montana public safety community relies heavily on radio communication. It connects responders to their dispatchers, field managers, each other, and — ultimately — to the public they serve. Radio provides dispatchers the ability to alert one or a group of responders of service calls, regardless of where the responder may be. It provides responders with a means of communicating their needs and actions independent of fixed facilities, such as land-line telephones or even cell-phone towers, which can quickly become overloaded during a major incident. In the field, radios provide responders the ability to manage incident response, independent of location, using an effective communications plan. And, those responders recognize that radios provide the most vital tool for their own safety.

Authorization

Authority to use radio frequencies can come by one of two primary means: license and interagency agreement. Land mobile radio licensing for state and local public safety agencies is the responsibility of the Federal Communications Commission (FCC). Federal agencies rely on the Interdepartmental Radio Advisory Council (IRAC) for frequency authorization.

Interagency agreements serve an important purpose in Montana public safety radio. When an agency licensed for a particular frequency allows another agency access to that frequency, a degree

of communications interoperability is established where otherwise there may have been none. Such an agreement means that the licensing agency is agreeing to consider the other agency's units as its own for use of the frequency. Everyone is obligated by the terms of the license; the agreements themselves may further restrict use. It should be noted that agreements are generally for mobile use only — permanent base stations must be specifically listed with the FCC.

Frequency utilization plans for all mutual aid and most common frequencies have been developed by the Public Safety Services Bureau, which is part of the State Information Services Technology Division within the Department of Administration. Although the Public Safety Services Bureau is responsible for managing the state's frequency programs, this manual refers to the Department of Administration, since it is the State of Montana official entity vested with authority for the land mobile public safety radio frequency utilization plan.

Authorization procedures for common frequencies are covered in Part X, "Management and Administration". Radio licenses are rarely granted for exclusive use. In Montana, frequency coordinators strive to make public safety agencies exclusive users within their jurisdictions, but increasing demands make this practice more and more difficult. A single agency is generally established as the primary user of a given frequency within its jurisdiction. Since fixed transmitters are often sited on mountain tops, coordinators must examine interference potentials far beyond that jurisdiction.

Permission to use Montana Mutual Aid and Common Frequencies requires an approved Mutual Aid and Common Frequencies permit from the State of Montana, Department of Administration at **https://app.mt.gov/mutualaid/.**

All users are subject to FCC regulations and standard operating procedures as outlined in the Mutual Aid and Common Frequency Manual, 2011 Edition. All frequency assignments will operate in narrowband emission effective October 1, 2012.

Priority Use Levels

There may be dozens of users within interference range, so it is important to remember that the primary user of a Montana mutual aid or common frequency is the user with the most urgent traffic. Mutual aid users are asked to remember that these frequencies are a critical shared resource.

You may be interested in knowing that current cell phone technology does not provide priority channels. For instance, if a police officer or fire fighter needs to make an emergency call, there is no guarantee that a cell phone call would go through if there are already a lot of calls on the network.

Five priority use levels are established for communications on mutual aid and common frequencies. Higher priority traffic takes precedent over lower.

1. **Immediate Peril - An immediate threat to human life exists.**
2. **Disaster or Extreme Emergency - An imminent threat to human life or of large-scale property destruction exists.**
3. **Routine Emergency - Distinguished from the above by scale or nearness of threat.**
4. **Urgent Administrative and Itinerant.**
5. **Training, Drills and Administrative.**

Color Names

The term "mutual aid" means different things to different people, even when restricted to radio. When used to name a frequency or particular channel, it often leads to confusion over just which mutual aid frequency is being referred to. In public safety radio where clarity and simplicity of communications are essential, long and contrived names for basic tools are burdensome. For this reason, the color names on the following page are offered for use in reference to mutual aid and common frequencies. Each is also given a descriptive title to clarify its use.

Color names were chosen because the names are short, commonly recognized, and have been linked with associative memory. The actual colors are not intended to be painted on radio control heads or otherwise used where different shades are indistinguishable or colorblind persons may mistake them.

Radio Efficiency

To maintain good radio etiquette, operators should observe the following guidelines and rules:

1. Restrict radio traffic to only what is necessary for the safe and efficient operation of the group. Communications equipment should only be used for official business or emergency communications.
2. Know what you're going to say before you key the mike. Keep transmissions as short as possible by being brief and to the point. Don't use big words when short ones will do. Leave out the "Ahs" and "Ohs."
3. Begin and end each transmission with an identifier such as a name or a call which is understood by all radio operators in the group. Avoid the use of first names or CB-type handles.
4. Listen before you begin your transmission, and always wait one or two seconds before you speak after keying the push-to-talk button.
5. Avoid profanity and the use of vulgar language. Such transmissions are expressly forbidden by the FCC in the LMR service.
6. Remain calm and speak directly and clearly, using an even tone. Avoid shouting, which distorts the transmission and does not increase the range of your radio transmission. In response to stress or excitement, you may find yourself increasing your delivery speed. The advantages of a rapid delivery may be lost if the message has to be repeated.
7. Pause your transmission every now and then. This practice ensures that the person on the other end is copying your transmission and also allows others to break in with more important information without walking over your transmission.
8. Don't read everything back because this practice doubles the use of air time. Instead say "Copy, over" and stand by for the next transmission. Use "Say again" for information you didn't copy.
9. Do not use the radio for private "chit-chat" or horseplay.
10. Remember, the whole world is listening. Scanners abound. Make sure you want what you say to be public knowledge. Comments made on the radio should not be offensive, derogatory or in poor taste.

Spelling Alphabets

Two "phonetic[1]" or spelling alphabets are used in public safety communications: the "International Radiotelephony Spelling Alphabet (IRSA)[2]" and the APCO (Association of Public Safety Communications Officials) Phonetic Alphabet. This alphabet is used by the Los Angeles Police Department (LAPD) and other local and state law enforcement agencies across the United States.

Both of these alphabets are used to spell out parts of a message or call sign that are critical or otherwise hard to recognize during voice communication. Enunciation tends to be lost during radio communication, and individual letters can be miss communicated. Using a spelling alphabet will reduce communication mistakes. Assigning code words to the letters of the English alphabet so that a letter's name begins with the letter itself (Alfa for A, Bravo for B, etc.) helps to ensure the intelligibility of voice communication via radio or telephone. Critical combinations of letters (and numbers) can be pronounced and understood by those who transmit and receive voice messages, regardless of their native language.

When safety is paramount, the use of a spelling alphabet provides additional precision of voice signals. It is advisable to alert the dispatcher or receiver that you will be spelling something before using a phonetic spelling. Also, try to pronounce the word or name prior giving the phonetic spelling. Tables 1 and 2 on the next two pages present the two spelling alphabet versions.

[1] These are not phonetic alphabets as in those used to guide pronunciation; instead, they are a selection of alphabets often used by radio operators to spell out words.

[2] Also known as the International Civil Aviation Organization (ICAO) Spelling Alphabet or the NATO Phonetic Alphabet.

Table 1: International Radiotelephony Spelling Alphabet

Letter	Phonetic	Spoken As
A	ALPHA	AL-fah
B	BRAVO	BRAH-voh
C	CHARLIE	CHAHR-lee
D	DELTA	DEL-tuh
E	ECHO	EK-oh
F	FOXTROT	FOKS-trot
G	GOLF	GOLF, GAWLF
H	HOTEL	Hoh-TEL
I	INDIA	IN-dee-uh
J	JULIETTE	JOO-lee-uht
K	KILO	KEE-loh
L	LIMA	LEE-mah
M	MIKE	mike, maik
N	NOVEMBER	Noh-VEM-ber
O	OSCAR	OS-ker
P	PAPA	Pah-PAH
Q	QUEBEC	Kwi-BEK
R	ROMEO	ROH-mee-oh
S	SIERRA	See-ER-uh
T	TANGO	TANG-go
U	UNIFORM	YOU-nuh-fawrm
V	VICTOR	VIK-ter
W	WHISKEY	HWIS-kee
X	X-RAY	EKS-rey
Y	YANKEE	YANG-kee
Z	ZULU	ZOO-loo
0	ZERO	ZEER-oh
1	ONE	WUHN
2	TWO	TOO
3	THREE	THUH-ree
4	FOUR	FAWR, FOHR
5	FIVE	FAHYV
6	SIX	SIKS
7	SEVEN	SEV-uhn
8	EIGHT	EYT
9	NINE	NAHY-ner

Table 2: APCO or LAPD Phonetic Alphabet

Letter	Phonetic	Spoken As
A	ADAM	AD-am
B	BOY	BOI
C	CHARLES	CHAHRLZ
D	DAVID	DEY-vid
E	EDWARD	ED-werd
F	FRANK	FRANGK
G	GEORGE	JAWRJ
H	HENRY	Hen-ree
I	IDA	AHY-duh
J	JOHN	JON
K	KING	KING
L	LINCOLN	LING-kuhn
M	MARY	MAIR-ree
N	NORA	NAWR-uh
O	OCEAN	OH-shuhn
P	PAUL	PAWL
Q	QUEEN	KWEEN
R	ROBERT	ROB-ert
S	SAM	SAM
T	TOM	TOM
U	UNION	YOON-yuhn
V	VICTOR	VIK-ter
W	WILLIAM	WIL-yuhm
X	X-RAY	EKS-rey
Y	YOUNG	YUHNG
Z	ZEBRA	ZEE-bruh
0	ZERO	ZEER-oh
1	ONE	WUHN
2	TWO	TOO
3	THREE	THUH-ree
4	FOUR	FAWR, FOHR
5	FIVE	FAHYV
6	SIX	SIKS
7	SEVEN	SEV-uhn
8	EIGHT	EYT
9	NINE	NAHY-ner

Communications-Order Model

To ensure effective understanding between persons communicating via radio equipment, the following five-step, message acknowledgement sequence is suggested. This standard method helps to ensure that messages are received and comprehended effectively, especially during emergency communications.

1. The calling unit provides the name of the called unit, followed by its own. For example: "Headwaters Staging, this is Rae Engine 2," where the engine is trying to contact the incident staging area.
2. The called unit responds with the reverse ("Rae Engine 2, Headwaters Staging").
3. The calling unit transmits its message. ("Allow the Meaderville Tactical Team through and direct it to the Command Post.")
4. The called unit repeats it back as received. ("Meaderville Tactical Team to Command Post.")
5. If the message was received correctly, the calling unit responds with an "Affirmative" acknowledgement. Otherwise, it responds "Negative" and repeats the message.

Part II: Montana Mutual Aid, Base Stations & Interop Channels

Introduction

Mutual aid and common frequencies have come to be recognized as the most valuable public safety radio resource because they are the means by which responders from different agencies and different public safety services can communicate and interoperate. Rarely does an incident of any magnitude occur in which a single agency is the sole service provider. Whether they are standby EMS providers, fire suppression crews during a barricaded suspect call, or the traffic control and evacuation personnel during an urban interface fire, public safety agencies need to interoperate in today's world of incident response.

No degree of interoperability is possible without common communications. In Montana, 18 mutual aid and 4 common frequencies provide the basis for interagency radio communications. This manual uses the term "mutual aid" to refer to frequencies designated for interagency communications that are licensed statewide. Authorization for their use is given through agreement with the State of Montana. Some also may be licensed for local use directly through the FCC. Procedures for both types of authorization are covered in Part X, "Management and Administration".

The term "common" refers to frequencies designated for interagency communications, but not licensed statewide as a mutual aid frequency. They must be licensed by the user agency and they may be used under agreement with that licensed agency for the purpose of communicating with them. Some are only available by agreement for communications with the license holder (e.g. the U.S. Forest Service common channel). For purposes of this manual, the term "common" is used for frequencies recognized across the state. Some jurisdictions using central dispatch have agreed on their own "common" channel, but these are referred to only in passing.

Table 3: Montana Mutual Aid General Use Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
153.9050	**GOLD**	None	General Mutual Aid and Coordination	
155.3400	**TAN**	VMED28	**Primary Use**: State Air-to-Ground Coordination **Secondary Uses:** EMS communications and medical staging at an incident scene.	10-Watt Airborne Limit restricted to under 5280 feet
157.4250	**NEON***	None	General Mutual Aid and Coordination	• Narrowband Only • 40-Watt Mobile Limit • Use above Line A requires special FCC approval through the Dept. of Administration
			• *Not available within 120 Km of Coutts, AB including the following jurisdictions: the Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties.* • *Not available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties as well as the Fort Peck Reservation due to co-channel use.*	
172.2250 Base TX 170.4750 Base RX	**ALPHA**	None	General Use Multi Agency Mobile Repeater	
172.3750 Base TX 170.5750 Base RX	**BRAVO**	None	General Use Multi Agency Mobile Repeater	

* ***NEW*** General Mutual Aid Simplex Frequency

Table 4: Montana Mutual Aid Law Enforcement Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
155.4750	**BLUE**	VLAW31	National Law Enforcement Emergency	• Secondary status to Canadian RCMP stations along the border • Requirement for receiver tone control (156.7 Hz) effective Oct. 1, 2012
155.7900	**SILVER**	None	Law Enforcement Mutual Aid	• Requirement for receiver tone control (156.7 Hz) effective Oct. 1, 2012
153.8000	**BLACK**	None	Law Enforcement Tactical	• Approved digital and encrypted use with regional SOP • Requirement for receiver tone control (156.7 Hz) effective Oct. 1, 2012 • Not to be used within 75 miles of the BLAIRMORE, HILLCREST & WARNER, ALBERTA areas per FCC license

Table 5: Montana Mutual Aid Fire Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
153.8300	**RUBY**	None	State Fire Repeater	
154.0700	**RED**	None	State Fire Mutual Aid	Not to be used within 75 miles of Bow Island, Alberta per FCC license
154.2800	**MAROON**	VFIRE21	State Command and Control	
154.2650	**CORAL**	VFIRE22	State Fire Ground #1	
154.2950	**SCARLET**	VFIRE23	State Fire Ground #2	
154.2725	**COPPER***	VFIRE24	State Fire Ground #3	• Maximum mobile power is 100 watts ERP • Narrowband Only • Secondary to adjacent 7.5kHz licensed channels where applicable • Special permission required for use
154.2875	**BURGUNDY***	VFIRE25	State Fire Ground #4	• Maximum mobile power is 100 watts ERP • Narrowband Only • Secondary to adjacent 7.5kHz licensed channels where applicable • Special permission required for use

* ***NEW*** Fire Tactical Frequencies

Table 5: Montana Mutual Aid Fire Frequencies *(continued)*

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
154.3025	**CRIMSON***	VFIRE26	State Fire Ground #5	• Maximum mobile power is 100 watts ERP • Narrowband Only • Secondary to adjacent 7.5kHz licensed channels where applicable • Special permission required for use
159.3450	**GARNET**	None	State Fire Repeater Control	

* ***NEW*** Fire Tactical Frequency

Table 6: Montana Mutual Aid EMS Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
155.2800	**WHITE**	None	Hospital-to-Ambulance and Hospital-to-Hospital Communications	
155.3400	**TAN**	VMED28	**Primary Use**: State Air-to-Ground Coordination **Secondary Uses:** EMS communications and medical staging at an incident scene.	10-Watt Airborne Limit restricted to under 5280 feet
155.3250	**GRAY**	None	**Primary Use**: Central Region Dispatch & Paging **Secondary Use:** On-scene incident management per SOP *(Treatment Group)*	Not to be used within 75 miles of Fort MacLeod, Alberta per FCC license
155.3850	**PINK**	None	**Primary Use**: Western/Eastern Region Dispatch & Paging **Secondary Use:** On-scene incident management per SOP *(Transport Group)*	

Table 6: Montana Mutual Aid EMS Frequencies *(continued)*

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
157.4250	**NEON**	None	General Mutual Aid and Coordination **Note:** EMS Priority during mass-casualty incidents. On-scene incident management per SOP *(Triage Group)*	• 40-Watt mobile limit • Use above Line A requires special FCC approval through the Dept. of Administration • Narrowband Only
• *Not available within 120 Km of Coutts, AB including the following jurisdictions: the Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties.* • *Not available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties as well as the Fort Peck Reservation due to co-channel use.*				

Table 7: Common Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
155.1600	**VIOLET**	None	National Search and Rescue	SAR Coordination Only
155.2200	**PURPLE**	None	State Search and Rescue	SAR Coordination Only
155.8200	**BROWN**	None	State DES Direction and Control	Use only per SOP or State DES approval
171.4750	**GREEN**	None	State/Federal Common	May be licensed by state forestry and conservation agencies and any others requiring access to the state (radio) system.

Table 8: Montana Interoperable Narrowband Frequencies *(FCC License Required)*

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
154.4525	**CHARLIE**	None	General Purpose Interoperability Channels for all fire, EMS, law enforcement, and medical agencies including local, state, tribal and federal users	Narrowband Only
155.7525	**DELTA**	None		Narrowband Only
158.7375	**ECHO**	None		Narrowband Only
159.4725	**FOX**	None		Narrowband Only

Airborne Usage

FFC Regulation §90.423 defined restrictions for using FCC frequencies for airborne-to-ground operations, as follows:

> FCC §90.423 (a) - Mobile stations . . . may be operated aboard aircraft for air-to-mobile, air-to-base, air-to-air and air-to-ship communications subject to the following: (1) Operations are limited to aircraft that are regularly flown at altitudes below 1.6 km (1 mi) above the earth's surface; (2) Transmitters are to operate with an output power not to exceed ten watts; (3) Operations are secondary to land-based systems; (4) Such other conditions, including additional reductions of altitude and power limitations, as may be required to minimize the interference potential to land-based systems.

The Department of Administration recommends not utilizing tactical channels in airborne operations, because this use has the potential to 'walk over' portable simplex ground communications, which may pose a risk to responder safety in nearby jurisdictions.

Base Station Use of Mutual Aid and Common Frequencies

Eight Montana mutual aid frequencies may be installed in base stations *(Note: The Montana Mutual Aid Permit system described in this section does not authorize base station frequency use. All requests for base station use must be licensed with the FCC with appropriate Letters of Concurrence from the State of Montana):*

- **GOLD** - The State Common Mutual Aid frequency may be licensed by public safety agencies eligible under FCC §90.20 as local government entities for installation in base stations. It must be licensed with the FCC by the agency and is restricted to secondary use (mobiles on this frequency being considered primary by the FCC). Base stations will be limited to 100 watts Base stations will be limited to 100 watts ERP. Antennas are limited to 20-feet in height above ground level or attached to an existing building.
- **MAROON** - The State Fire Command and Control frequency may be licensed by fire service agencies for base station installation as provided by Montana Mutual Aid Radio, Fire Frequencies, Policies and Procedures.
- **BLUE** - The National Law Enforcement Emergency frequency may be installed in base stations by law enforcement agencies through authorization by the Montana Department of Administration, as provided in Part IV of this publication.
- **SILVER** - The State Law Enforcement Mutual Aid frequency may be licensed by law enforcement agencies for base station installation as specified in Part IV of this manual.
- **WHITE, TAN, GRAY,** and **PINK** - The State EMS frequencies may be licensed as presented in Part VI, "Emergency Medical Services".

Other Montana common frequencies may be installed in base stations, as well:

- **BROWN** - The State DES direction and control frequency may be licensed as specified in Part VII, Disaster and Emergency Services (DES).
- **VIOLET** and **PURPLE** - The National and State Search and Rescue frequencies may be licensed as outlined in Part VIII: Search and Rescue.

VLAW31 BLUE Channel Monitored Base Stations

Below is a list of local and state agencies that maintain 155.4750 MHz (**BLUE**) base stations. These base stations may be utilized for emergency contact or cross-agency coordination in the event of an emergency.

Table 9: VLAW31 BLUE Channel Monitored Base Stations[3]

Location	Agency	Lat. Lon.	Call Sign
Billings Region			
Billings Detention Center	Yellowstone County Sheriff	45-45-21.8 N 108-30-27.5 W	WNYD515
Billings MHP Office	MHP Office	45-45-55.8 N 108-31-41.5 W	WNRR241
Laurel	Laurel PD	45-39-49.8 N 108-46-02.5 W	WNRR242
Central Montana			
Choteau	Teton County Dispatch	47-41-02.8 N 112-14-56.1 W	WNYD515
Fort Benton	Chouteau County Dispatch	47-49-15.9 N 110-40-36.8 W	WNYD318
Great Falls	Great Falls Dispatch	47-30-08 N 111-18-32 W	WNSW984
Harlowton	Wheatland County Dispatch	46-26-10.8 N 109-49-57.7 W	WNSX411
Helena	Department of Justice	46-35-09.8 N 112-01-3.0 W	WNVB345
Hogback Mountain	MHP Dispatch	48-49-36.8 N 111-42-35.9 W	WNRQ753
Lewistown	Fergus County Dispatch	47-03-37.9 N 109-25-48.7 W	WNRQ777
Townsend	Broadwater County Sheriff	46-19-27.8 N 111-29-46.9 W	WNUB356

[3] The information in Table 9 was accurate at the time of publication. Periodic updates will be posted at http://pssb.mt.gov.

Table 9: VLAW31 BLUE Channel Monitored Base Stations *(continued)*

Location	Agency	Lat. Lon.	Call Sign
Eastern Montana			
Garfield County	Garfield County Sheriff	47-29-16 N 107-07-32.3 W	WNUB358
		47-04-15 N 106-53-06.2 W	
		47-19-04 N 106-55-04.2 W	
Glendive	MHP/Dawson County	47-06-22.0 N 104-44-21.9 W	WNRQ765
Miles City	Custer County Detention	46-24-27 N 105-50-27 W	WNRQ769
Wibaux	Wibaux County Sheriff	46-59-00 N 104-11-21.8 W	WNYD503
Northern Tier Counties			
Cut Bank	Glacier County Sheriff and Cut Bank Police	48-39-07.9 N 112-19-48.2 W	WNUB243
Havre	Hill County Sheriff	48-29-36.0 N 109-48-47.7 W	KNJX594
Scobey	Daniels County Sheriff	48-45-03.1 N 105-29-02.0 W	WNSW985
South-Central Montana			
Bozeman	MSU Police Dept.	45-39-37.2 N 111-02-48.2 W	MSU 232
Western Montana			
Butte	MHP Office	45-57-20.7 N 112-30-30.1 W	WNRR244
Hamilton	Ravalli County 9-1-1	46-15-04.7 N 114-09-36.3 W	WNRQ770
Thompson Falls	Sanders County Dispatch	47-35-49.8 N 115-20-49.6 W	WNRQ757
Little Thompson Peak	Mineral County Dispatch	47-10-44 N 114-54-29 W	WNPT689
Missoula MHP Office	MHP Office	46-53-05.7 N 114-01-17.4 W	WNRQ778
Pablo	Salish-Kootenai Tribe	47-43-32.8 N 114-23-32.5 W	WNRQ767
Polson	Lake County Dispatch	47-41-29.8 N 114-09-43.4 W	WNRQ766

Table 10: GOLD Channel *(153.9050 MHz)* Monitored Base Stations[4]

Location	Agency	Lat. Lon.	Call Sign
Central Montana			
Conrad	Pondera County Dispatch	48-10-13.9 N 111-56-38.1	WNVB756
Fort Benton	Chouteau County Dispatch	47-49-15.9 N 110-40-36.8 W	WNUK244
Eastern Montana			
Forsyth	Rosebud County Dispatch	46-20-17.0 N 106-41-50.1 W	WPKV524
Hardin*	Big Horn Dispatch	45-43-49.9 N 107-36-31.3 W	WZQ546
Miles City	Custer County Dispatch	46-24-27 N 105-50-27 W	WNRQ769
Terry*	Prairie County Courthouse	46-47-19.0 N 105-18-28.9 W	WPUD269
Northern Tier Counties			
Scobey	Daniels County Dispatch	48-48-00.1 N 105-21-02.0 W	WNUQ241
Southwest Montana			
Anaconda	Anaconda-Deer Lodge Dispatch	46-07-53.0 N 112-57-26.0 W	WPNY623
Dillon	Beaverhead County Dispatch	45-37-35.9 N 113-42-25.3 W	WPWL708
Virginia City Hill	Madison County Dispatch	45-16-25.7 N 111-54-45.9 W	WNRR222

[4] The information in Table 10 was accurate at the time of publication. Periodic updates will be posted at http://pssb.mt.gov.

* Monitored only during regular business hours.

Conventional Interoperability Channels

The following is a list of P25 conventional repeater resources located at statewide interoperable trunking radio sites. These repeaters may be used as a typical conventional analog/digital asset, or be patched into trunking talk groups by a regional dispatch center. This list is accurate at the date of publication. Updates to this list may be found at **www.pssb.mt.gov**.

Table 11: P25 Conventional Repeater Channels*

Site	County	Lat. Lon.	Repeater TX (MHz)	Repeater RX (MHz)
Central Montana				
Belgium Hill	Pondera	48-19-47.2 N 112-02-9.9 W		
Flying J	Cascade (Great Falls)	47-28-08.9 N 111-21-09.3 W	155.7300	159.1650
Highwood Baldy	Judith Basin	47-26-34.0 N 110-37-51.0 W	151.1375	158.7375
Judith Peak	Fergus	47-13-03.7 N 109-13-16.8 W		
Pacific Steel	Cascade (Great Falls)	47-31-49.6 N 111-15-45.7 W	155.7300	159.0600
South Moccasin	Fergus	47-10-40.5 N 109-32-10.0 W		
Sullivan	Cascade	47-17-22.9 N 112-00-33.9 W		
Eastern Montana				
Fallon	Dawson	46-55-28.5 N 105-09-57.0 W	151.3100	159.0900
Fox Creek	Richland	47-42-44.0 N 104021-23.0 W	154.2050	159.3900

* Shaded repeater information was pending at the time of publication. Please check http://pssb.mt.gov for updates.

Table 11: P25 Conventional Repeater Channels *(continued)*

Site	County	Lat. Lon.	Repeater TX (MHz)	Repeater RX (MHz)
Eastern Montana *(continued)*				
Government Hill	Custer	46-24-14.7 N 105-39-49.3 W	151.3250	159.0600
Makoshika	Dawson	47-03-09.1 N 104-40-20.2 W	154.1300	159.1800
Highwood Baldy	Judith Basin	47-26-34.0 N 110-37-51.0 W	151.1375	158.7375
I-15/90 Consortium				
Butte 9-1-1 Center	Butte-Silver Bow	46-00-54.0 N 112-32-11.0 W	155.6850	159.1500
Red Mountain	Butte-Silver Bow	45-46-19.0 N 112-29-43.0 W	155.9250	158.9250
Northern Tier Consortium				
Antoine Butte	Phillips	47-55-55.8 N 108-34-38.6 W	154.8450	159.9100
Big Mountain	Flathead	48-30-21.0 N 114-20-52.4 W		
Blacktail	Flathead	48-00-38.8 N 114-21-47.5 W	151.1450	158.8500 (156.7 tone)
Blue Mt.	Lincoln	48-29-57.0 N 115-27-07.0 W	161.9500	159.0450* (156.7 tone)
Culbertson	Roosevelt	48-12-1.1 N 104-31-55.2 W	155.1300	156.0900
Desert	Flathead	48-25-47 N 113-57-38 W	153.8450	158.9550
Divide	Glacier	48-40-7.5 N 113-23-10.2 W	154.1750	154.8000
Gideon	Valley	48-06-33.7 N 106-43-15.3 W	154.0550	156.1500

Table 11: P25 Conventional Repeater Channels *(continued)*

Site	County	Lat. Lon.	Repeater TX (MHz)	Repeater RX (MHz)
Northern Tier Consortium *(continued)*				
Hill County SO	Hill	48-43-8.8 N 109-42-24.6 W	154.7100	156.2100
Jette	Lake	47-46-25.1 N 114-16-09.4 W	155.5200	156.0300
King	Lincoln	48-29-11 N 115-47-37 W		
Mt. Royal	Liberty	48-51-19 N 111-08-19 W	151.1375	158.7375
Opheim	Valley	48-51-45.1 N 106-29-40.1 W	154.1750	154.8000
Pinkham	Lincoln	48-38-34.9 N 115-05-30.6 W	154.9500	158.8200
Plentywood	Sheridan	48-41-36.9 N 104-35-42.1 W	158.8500	154.8000
Saco	Phillips	48-27-12.3 N 107-27-30.1 W	151.1375	158.7375
Scobey	Daniels	48-48-05.0 N 105-20-55.0 W	155.5200	156.0300
Windy Hill	Roosevelt	48-12-35.1 N 105-35-21.4 W	151.1375	158.1375
South Central Consortium				
Bozeman EOC	Gallatin (Bozeman)	45-41-20.22 N 111-1-59.97 W		
High Flat	Gallatin	45-38-15.76 N 111-16-07.75 W		
Kenyon Water Tank	Gallatin (Bozeman)	45-39-42.84 N 111-01-31.38 W		
Meyer's Flat	Park	45-39-57.6001 N 110-27-59.9760 W		

Table 11: P25 Conventional Repeater Channels *(continued)*

Site	County	Lat. Lon.	Re-peater TX (MHz)	Re-peater RX (MHz)
South Central Consortium *(continued)*				
Timberline	Gallatin	45-39-31.70 N 110-48-25.0 W		
Greycliff	Sweetgrass	45-47-34.8 N 109-40-13.6 W		
Tri-County Consortium				
Belmont	Lewis & Clark	46-44-53 N 112-52-19.0 W	153.7850	154.0850
Bull Mountain	Jefferson	45-55-14.2 N 112-01-17.8 W		
Cominco	Powell	46-37-44.9 N 112-47-22.5 W		
Hogback	Lewis & Clark	46-49-35.9N 111-42-46.3 W	154.9650	153.9500
LEC	Lewis & Clark	46-35-10.9 N 112-02-11.9 W	155.5200	156.0900
Mac Pass	Lewis & Clark	46-35-47.9 N 112-17-59.7 W	155.7600	153.9550
Knob Hill	Lewis & Clark	46-34-29.2 N 111-59-06.9 W	154.2525	158.7375
Stonewall	Lewis & Clark	47-02-36 N 112-42-15 W	156.1500	154.0100
Sunset	Lewis & Clark	47-05-38.7 N 112-20-02.5 W	154.8600	156.0900
Wirth Ranch	Lewis & Clark	47-00-04.3 N 112-06-12.4 W	156.2100	159.2100
Western Consortium				
Pat's Knob	Sanders	47-22-21.1 N 114-51-37.1 W	159.0700	155.7300

Part III: NIMS and ICS

Introduction

The National Incident Management System (NIMS) coordinates emergency preparedness and incident management among various federal, tribal, state and local agencies. It is partially based on the Incident Command System (ICS). ICS is a set of best practices that have been integrated into a common organizational structure designed to improve emergency response operations. ICS provides standardized response and operational procedures to reduce problems and potential for miscommunication on incidents of all types and complexities. NIMS and ICS help to ensure:

- The safety of responders and others.
- The achievement of tactical objectives.
- The efficient use of resources.

For additional resources on ICS and NIMS, visit:

- **http://www.fema.gov/emergency/nims/**
- **http://www.fema.gov/emergency/nims/IncidentCommandSystem.shtm**

This Mutual Aid Manual excerpts some of the relevant emergency communications protocols and techniques that emphasize the use of plain language (also known as clear text), common terminology, and incident communications plans — all which help to ensure interoperability.

FEMA

Plain Language/Clear Text

A key component of interoperable communications is the ability to communicate using plain language. What is it? Plain Language is defined as: "communication that can be understood by the intended audience and meets the purpose of the communicator." The use of plain language in daily operations enhances the responder's ability to support a mutual aid event.

The use of plain language in emergency management and incident response:

- Is a matter of safety.
- Facilitates interoperability across agencies/organizations, jurisdictions and disciplines.
- Ensures that information dissemination is timely, clear, acknowledged, and understood by all intended recipients.

The use of codes — particularly agency-specific and ten-codes — is a barrier when it comes to transmitting information. While codes may ideally reduce the length of transmissions, in practice the time gained is lost in repeated messages and explanations of unfamiliar terms. Codes or terms used by one jurisdiction or discipline may be incompatible with those used by neighboring agencies. Communications during mutual aid events should be in plain language to avoid miscommunication and confusion, improve interoperability, and enhance public safety.

The use of plain language also is consistent with the National Incident Management System (NIMS) Sept. 10, 2009 alert that states: "The use of plain language in an emergency response is a matter of public safety, especially the safety of first responders and those affected by the incident."

Plain language simplifies the communication process and reduces the chance of error during an emergency situation. For these reasons, plain language and clear text are strongly encouraged on all mutual aid and common channels.

A Note about Tactical Language and Encryption on Mutual Aid Channels

Although plain language may be appropriate during response to most incidents, tactical language is occasionally warranted due to the nature of the incident (i.e. during an ongoing terrorist event).

The use of any mutual aid channel for transmission of any encoded, encrypted, digital, or scrambled message is prohibited with two exceptions:

1. Tactical law enforcement operations on the **BLACK** channel where encryption may be utilized in combination with a regional plan.
2. Some hospitals or EMS organizations may have written communication plans in place to use the **WHITE** channel for sensitive ambulance-to-hospital communications.

Encryption is prohibited on mutual aid channels because it largely eliminates interoperability and causes other users to cease monitoring the affected channel. It also requires a degree of cooperation between agencies that suggests a normal operational channel should be used for the communications.

The protocols for using specialized encryption and tactical language should be incorporated into your Incident Action Plan or Incident Management Communications Plan.

A critical part of an effective multiagency incident management system is for all communications to be in plain English. Table 12 on the following page provides examples of radio codes, acronyms and slang terms that should be avoided and provides plain language and alternatives to use. The use of these terms should be avoided, especially during incidents requiring the participation of multiple agencies or organizations.

Table 12: Radio Terms to be Avoided and Alternatives

Avoid Ten-Codes	Use Plain Language/Clear Text
10-4	"Okay" or "Understood"
10-33" or "Code 33	In one agency this code may mean "emergency traffic," while at an agency a few miles away it may mean "no warrants, past record not checked."
What's your 10-20?	"Where are you?"
10-50	In one jurisdiction, this code may mean "an accident" while in another it may indicate "Dead on Arrival".
Avoid Acronyms	**Spell Out What the Acronym Means**
A.O.S.	Arrived on Scene
A/O	Alert and Oriented
D.O.A.	Dead on Arrival
D.R. or D.R.O	Disaster Relief or Disaster Relief Operation
MCI	Mass (or Multiple) Casualty Incident
MVA	Motor Vehicle Accident (or Auto Accident)
ST	Subject Trapped
Avoid Jargon or Slang	**Use Plain English**
187	Homicide
Band Aid Box	Ambulance
Boot	New Fire Fighter
Catch the Plug	Get hooked up to the fire hydrant
Master Key	Bolt Cutters
Meat Wagon	Ambulance
Pin Job	Auto accident with entrapment
Probie	Probationary First Responder
Taxi Run	Hospital transfer
Vollie	Volunteer

Standard Words and Phrases

The use of standard words and phrases helps to conserve airtime. They are short, easily understood, and they convey concise meaningful information. Standard expressions reduce confusion as well as the amount of time spent transmitting messages. Table 13 presents a list of standard expressions and their meanings.

Table 13: Standard Expressions and Meaning

Standard Radio Expression	Meaning
Acknowledge	Confirms that you understand the message.
Address Check	Responding apparatus requesting that an address be repeated or the calling party be contacted again to confirm the location.
Advise	"Give this message to…"
Affirmative	"Yes"
At Scene	Used when Units arrive at the scene of an incident. Example: "Perris, Engine 6183, at scene".
Available at Residence	Used by administrative or staff personnel to indicate they are available and on-call at their residence.
Be Advised	Reflects the desire to make another party aware of specific information.
Begin Tour	Personnel or apparatus are on duty and ready.
Can Handle	Used with the amount of equipment needed to handle the incident. Example: "Susanville Battalion 2212; can handle with units at scene".
Confirm(ing)	Verify the accuracy of the entire message that was just transmitted and correct it if necessary.
Copy, Copies	Used to acknowledge message received. The Unit radio identifier also must be used. Example: "Engine 2675, copies".
Correct	What has just been transmitted is accurate.
Correction	An error was made in the previous radio transmission. The correct version is…
Disregard	Ignore the previous message/radio traffic.

Table 13: Standard Expressions and Meanings *(continued)*

Standard Radio Expression	Meaning
Do You Copy?	Do you understand? Please acknowledge.
Emergency Traffic	Term used to gain control of radio frequency to report an emergency. All other radio users will refrain from using that frequency until cleared for use by the communications center.
Emergency Traffic Only	Radio users will confine all radio transmissions to the emergency in progress or, if needed, to a new incident. Radio traffic related to status information (such as reports on conditions, "responding," "at scene" and "available") are authorized during this period.
En Route	Resources are heading to the incident.
End Tour	Personnel or apparatus are off duty.
Hold Traffic	All on-air personnel are to cease radio transmissions and traffic.
In-Quarters	Apparatus has safely arrived at a station; if multiple pieces of apparatus arrive in-quarters at once, one piece should transmit the message: "All Station 10 apparatus in-quarters".
In-Service	Apparatus is mechanically sound, equipment is functional, and able to respond; not synonymous with "ready." Example: "Fortuna, Engine 1283, in-service, fire prevention inspections".
Loud and Clear	The transmission is coming across loudly and clearly.
Negative	"No"
Not Ready	Apparatus is not ready to respond to an incident; not synonymous with "out-of-service".
Okay	Your message is received, understood, and will be complied with.
On Location	Apparatus or personnel have arrived at the scene of an incident, stand-by or event.

Table 13: Standard Expressions and Meanings *(continued)*

Standard Radio Expression	Meaning
Out	Transmission is finished.
Out-of-Service	Apparatus is mechanically disabled or equipment is not functional, and unable to respond to incidents; not synonymous with "not-ready." Example: "Auburn, transport 2341, out of service". Note, when repairs have been completed, the following phrase should be used: "Auburn transport 2341, back".
Over	Information has been passed; waiting for reply.
Priority Traffic	An imminent danger to life, limb, or property exists; not used simply due to heavy radio traffic or to relay routine radio traffic to the dispatcher.
Ready	Apparatus is ready to respond to an incident; not synonymous with "in-service".
Repeat	Repeat your message. I did not understand it the first time.
Respond	Used during dispatch: proceed to or proceeding to an incident. Example: "Engine 5176, respond".
Responding	Given apparatus is responding to an event or incident. Example: "St. Helena, Engine 1375 responding".
Response Check	Verbal inquiry initiated by dispatcher to check if apparatus is responding to an incident.
Resume Normal Traffic	Normal radio traffic may begin again.
Return to	Normally used by communications center to direct available units to a station or other location.
Returning	Apparatus or personnel are leaving the scene of an incident; usually used with terms "ready" or "not-ready".
Stand By	"Listen but do not transmit until directed to do so".
Status Air	Apparatus or personnel are away from an assigned location such as a station, performing errands or other tasks.

Table 13: Standard Expressions and Meanings *(continued)*

Standard Radio Expression	Meaning
Stop Transmitting	Stop speaking over the radio.
Test Count	Used for the purposes of testing a specific radio or the radio system infrastructure; a five (5) count will be conducted twice: "1, 2, 3, 4, 5... 5, 4, 3, 2, 1".
Uncovered	Indicates a unit is not in-service because there are no personnel to operate it.
Understood	Your message is received, understood, and will be complied with.
Unreadable	Used when signal received is not clear. In most cases, try to add the specific trouble. Example: "Unreadable, background noise".
What is your Location?	Where is the unit located?

Common Terminology

The ability to communicate within ICS is critical. Using standard or common terminology is essential to ensure efficient, clear communications. ICS requires the use of common terminology, including standard titles for facilities and positions within the organization.

Three elements of emergency response have been established where common terminology is essential:

- **Organizational Functions:** Major functions and functional units with incident management responsibilities are named and defined. For organizational elements, terminology is standard and consistent.
- **Resource Descriptions:** Resource Descriptions refer to the combination of personnel and equipment used in tactical incident operations. These resources (personnel, facilities, and equipment/supply items) are given common

names and are "typed" or categorized by their capabilities. This practice helps to avoid confusion and enhances interoperability.

- **Incident Facilities:** Common terminology is used to designate incident facilities, such as the command post, incident base, and staging areas.
- **Position Titles:** ICS management or supervisory positions are referred to by titles, such as Officer, Chief, Director, Supervisor, or Leader.

Here are some examples of location identifiers or position titles that are known by all incident personnel and instructed nationally and in ICS.

- **Location Examples**: Division B, Drop Point 2, Staging Area, and Helio-base
- **Functional Titles**: Incident Commander, Taskforce Leader, Safety Officer, Medic, or Operations Section Chief.

Incident Communications Plans

Communications is the central nervous system of all-hazards emergency response operations. The use of a common communications plan is essential for ensuring that responders can communicate with one another during an incident. Communication equipment, procedures, and systems must be able to operate among multiple jurisdictions and disciplines — including fire, law enforcement, and emergency medical services (EMS). Within Montana, mutual aid and common frequencies may be tailored for specific situations.

Communications in the ICS Structure

The Communications Unit is often established early in multi-agency and large-scale responses managed under ICS to support an integration effort. This practice is intended to bring all communications functions close to incident command rather than having them managed far away from vital operational concerns.

Structurally, the Communications Unit operates in the Logistics Section, under the Service Branch. It is managed by the Communi-

cations Leader (COML). Dispatchers (radio operators) and communications technicians serving the incident also are part of the Unit. Under COML leadership, the Communications Unit is responsible for integrating wired and wireless communications as well as for ensuring that operations are supported by communications wherever necessary. The COML develops the Incident Radio Communications Plan, ICS Form 205.

The extended plans offered in this *Mutual Aid Manual* reflect ICS structure. Information about pre-planning, basic interagency operations, inter-discipline operations, and extended incidents is presented below:

Pre-Planning

Developing an integrated voice and data communications system, including equipment, systems, and protocols, is part of pre-planning that is needed prior to an incident.

Under ICS, communications is integrated into management systems by the involvement of a COML in incident action planning and the early establishment of a Communications Unit during incidents. These practices not only ensure that the response is well supported by communications, but also reinforces command structures and operating principles generally embodied in ICS, such as management span of control.

- **Span-of-Control**: Span-of-control refers to the number of personnel for whom a supervisor is responsible. Maintaining adequate span of control throughout the ICS organization is essential for safety and planning purposes. The span of control is often expressed as the ratio of supervisors to personnel. It is suggested that a single supervisor have a span-of-control of between three to seven persons, with five considered average.

  Mutual aid frequencies offer additional channels of communications for the hierarchical organization generated by a proper span-of-control. Users should employ as many channels as necessary, within this *Mutual Aid Manual's* guidelines. Under practical conditions, this means that a single channel during an incident response would ideally have no more than one manager and three to seven subordinates.

- **Inventory of Resources and Needs Analysis**:

  A plan for emergency response communications should begin with an inventory of available resources combined with an analysis of likely classes of emergencies. Resources may include everything from paging receivers to mobile relays and from cell phones to central office telephone switches. As a practical matter, an inventory best serves an agency if it not only looks at individual pieces of hardware, but also how that hardware is used as part of a system. In this manner, redundancies are highlighted and risky dependencies are exposed.

  Identification of outside equipment and services is equally important in pre-planning. Public safety agencies often rely on general mutual aid agreements with other jurisdictions to meet their equipment and service needs. Agencies within a given geographical area may form cooperative agreements to share resources when emergency needs arise. Similar agreements may be made with others outside the area in case a disaster overwhelms local resources.

  Careful attention should be given to equipment and services from the private sector, including cellular communications companies, private mobile radio, radio telephone, and radio common carriers. These resources could prove to be invaluable during an emergency.

  An agency's jurisdiction and responsibilities affect its communications requirements and determine what types of emergencies it may face. If, as part of the pre-planning process, an agency can categorize types of emergencies based on projected communications needs, resource utilization can be simplified.

A needs analysis provides a basis for decisions about the adequacy of existing resources, the requirements for outside resources, and most importantly, about the transition point from normal, everyday emergency operations to special equipment, networks, and procedures. Unfortunately, the failure to recognize the need for transition, especially in command and communications, often turns emergencies into disasters. Pre-planning is necessary for informed decisions and orderly transitions.

Basic Inter-Agency Operations

Basic inter-agency operations are simplified by mutual aid and common radio frequencies. In the vast majority of instances, using a single common frequency between a few agencies provides all the communications interoperability needed. And most of the communication in those instances is between units of similar function—i.e. deputy sheriff-to-highway patrol officer; rural firefighter-to-city firefighter. This *Mutual Aid Manual* refers to radio contacts between different public safety services as "Inter-Discipline Communications", which are implicitly inter-agency by nature. The topic of **Inter-Discipline Communications** is addressed in the next section.

The incident communications plan for basic (tactical) inter-agency operations is the designated mutual aid frequency for the involved service.

Four frequencies form the core mutual aid resources for tactical use within the following respective disciplines. They are:

- **SILVER - State Law Enforcement Mutual Aid**
- **RED - State Fire Mutual Aid**
- **WHITE - Statewide Hospital-to-Ambulance**
- **PURPLE - Statewide Search and Rescue**

While the **TAN** channel is primarily intended for air-to-ground communications, its inclusion here is to establish it secondarily as a tactical channel asset to be used by EMS in extended incidents.

Inter-Discipline Operations

One frequency has been licensed statewide for inter-discipline use and is the most widely spread among public safety agencies and emergency responders. It is intended as the primary communications channel between different services. It is: **GOLD - State Common Mutual Aid**

All Montana public safety radio users have access to the **GOLD** frequency. The incident communications plan for a basic inter-discipline operation includes only one channel: **GOLD**. For example, response to a traffic accident may appear as shown in Figure 1.

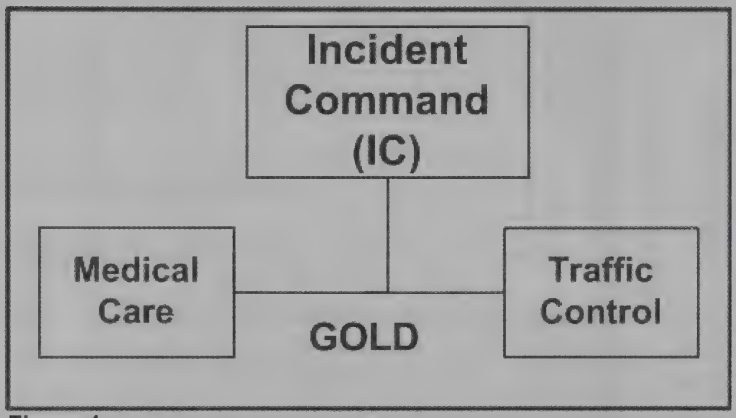


Figure 1

Sample Plan A:

A more complex operation may have multiple functions within various public safety services; so, other service-specific frequencies would begin to be used. Figures 2a, 3a and 4a show filled-out samples of ICS Form 205 (Radio Incident Communications Plan) for three different incidents. Sample Plan A on the following page describes the radio channel utilization depicted in Figure 2b. **Note:** The **GOLD** frequency is reserved for inter-discipline use.

By the way, convention calls for frequency lists to show four digits after the decimal place, followed by either an "N" or a "W", depending on whether the frequency is narrow or wide band.

INCIDENT RADIO COMMUNICATIONS PLAN ICS-205	INCIDENT NAME	DATE/TIME PREPARED	OPERATIONAL PERIOD DATE/TIME
	Sample Plan "A"		

BASIC RADIO CHANNEL UTILIZATION

Channel No.	Channel Name	Assignment	RX Frequency Narrow band (N) Wideband (W)		RX Tone/NAC	TX Frequency Narrow band (N) Wideband (W)		Tx Tone/NAC	Mode Digital (D) Ananlog (A) or Mixed (M)	Remarks
1	GOLD	IC Group Supervisors	153.9050	N						Command
2	TAN	Medical Care Group Supervisors & Group Unity	155.3400	N						Medical Care Tactical
3	RED	HAZMAT Group Supervisors & Group Units	154.0700	N						HAZMAT Tactical
4	SILVER	Traffic Control Group Supervisor & Group Units	155.7900	N						Traffic ControlTactical
...										

ICS-205 Prepared By (Communications Unit):

Figure 2a: Sample Plan A

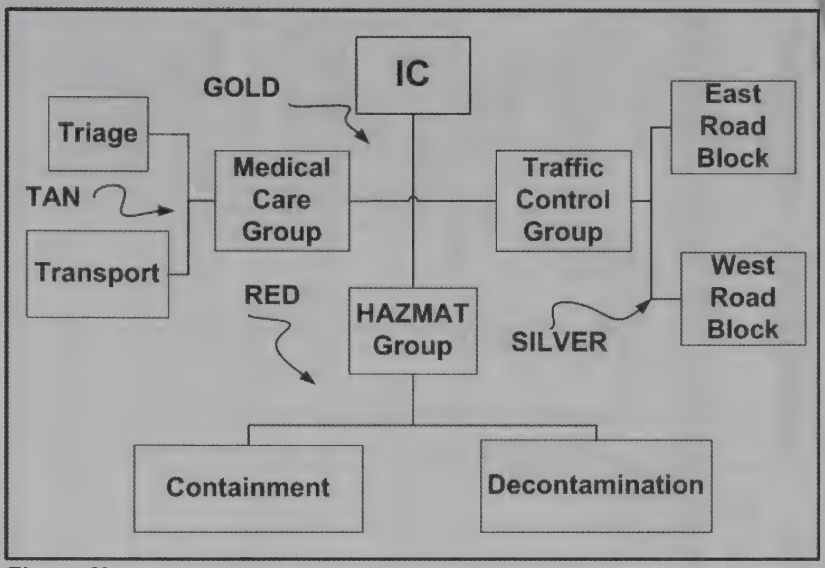


Figure 2b

Extended Incidents

Sample Plan B:

When several units within an agency respond to a multi-agency, multi-discipline incident, a more complex communications plan may be needed. Such cases add at least one more level to the command structure and this should be reflected in the plan. Figure 3a shows the radio channel utilization of Sample Plan B, while Figure 3b diagrams it.

Note: The **GOLD** channel is reserved for the first inter-discipline level of communications and the **RED**, **SILVER** and **TAN** channels are used at the first interagency level within a discipline.

Channels A, B, C, and D in Figure 3b represent the agencies' own working frequencies. Subsequent parts of this *Mutual Aid Manual* expand on separate communications plans for law enforcement, fire services, Emergency Medical Services (EMS), Disaster and Emergency Services (DES) and Search and Rescue.

INCIDENT RADIO COMMUNICATIONS PLAN ICS-205	INCIDENT NAME	DATE/TIME PREPARED	OPERATIONAL PERIOD DATE/TIME
	Sample Plan "B"		

BASIC RADIO CHANNEL UTILIZATION

Channel No.	Channel Name	Assignment	RX Frequency Narrowband (N) Wideband (W)		RX Tone/NAC	TX Frequency Narrowband (N) Wideband (W)		Tx Tone/NAC	Mode Digital (D) Analog (A) or Mixed (M)	Remarks
1	GOLD	IC Group Supervisors	153.9050	N						Command
2	TAN	Medical Care Group Supervisors & Group Unity	155.3400	N						Medical Care Tactical
3	RED	HAZMAT Group Supervisors & Group Units	154.0700	N						HAZMAT Tactical
4	SILVER	Traffic Control Group Supervisor & Group Units	155.7900	N						Traffic ControlTactical
5	A	Road block team leader & units								Road Block Tactical
6	B	Traffic direction team leader & units								Traffic DirectionTactical
7	C	Containment team leader & units								Containment Tactical
8	D	Decontainment team leader & units								Decontainment Tactical

ICS-205 Prepared By	(Communications Unit):

Figure 3a: Sample Plan B

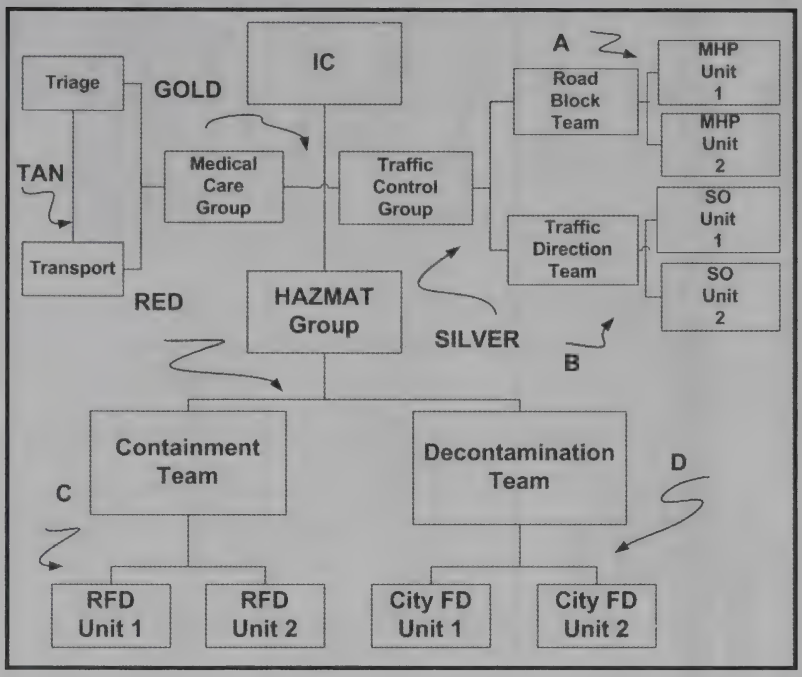


Figure 3b

Sample Plan C

The most complex plan presented here is one where the magnitude of response would cause an incident commander to give up direct management of operational resources and sub-divide operations activities from other incident management. In such a case, the operations section would continue using a communications net similar to that illustrated in Figure 4b. Minor additions for an extended command structure and a command/control net have been made. Sample Plan C is described in the radio channel utilization plan depicted in Figure 4a.

INCIDENT RADIO COMMUNICATIONS PLAN ICS-205	INCIDENT NAME	DATE/TIME PREPARED	OPERATIONAL PERIOD DATE/TIME
	Sample Plan "C"		

BASIC RADIO CHANNEL UTILIZATION

Channel No.	Channel Name	Assignment	RX Frequency Narrow band (N) Wideband (W)		RX Tone/NAC	TX Frequency Narrow band (N) Wideband (W)		Tx Tone/NAC	Mode Digital (D) Ananlog (A) or Mixed (M)	Remarks
1	BROWN	ICS Command Staff, General Staff, EOC	155.8200	N						Command
2	GOLD	Ops Section Chief, HAZMAT, Medical Care & Traffic Control Group Supervisors	153.9050	N						Operations
3	TAN	Medical Care Group Supervisors & Group Unity	155.3400	N						Medical Care Tactical
4	RED	HAZMAT Group Supervisors & Group Units	154.0700	N						HAZMAT Tactical
5	SILVER	Traffic Control Group Supervisor & Group Units	155.7900	N						Traffic ControlTactical
6	*	Team leaders and their respective units	*							[Team tactical use] * Individual units use their own frequencies for intra-agency communications

ICS-205 Prepared By	(Communications Unit):

Figure 4a: Sample Plan C

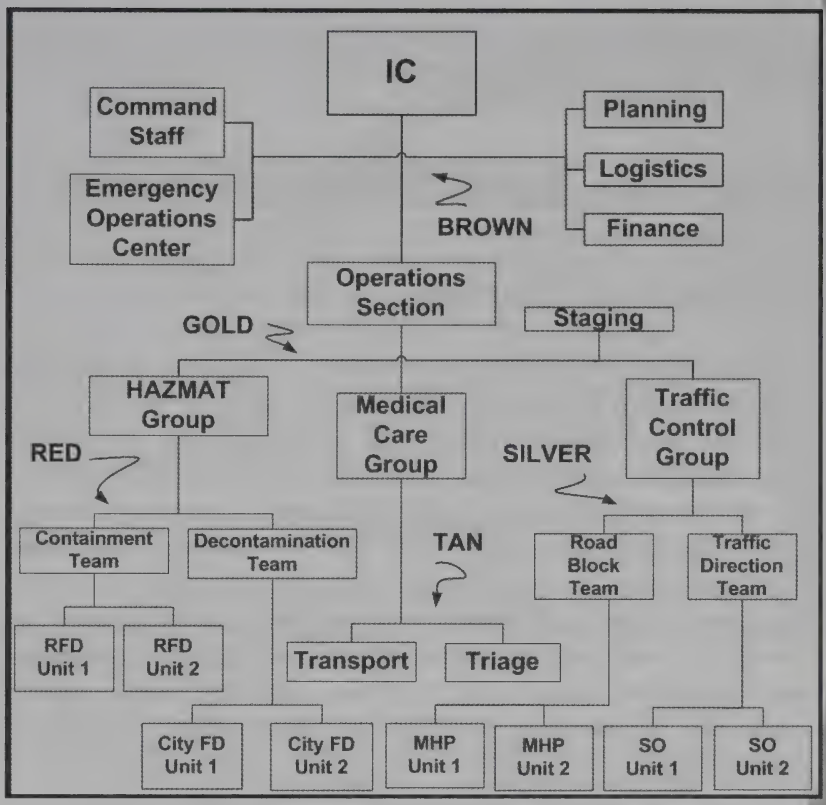


Figure 4b

Note that the **BROWN** frequency (State DES Direction & Control) has been appropriately used in this example for the command/ control function, which is a level above field mutual aid resources.

Two principles span these plans:

1. Frequencies assigned for basic interagency communications remain at the first interagency level from the bottom (**RED**, **SILVER**, and **TAN** in these examples).

2. The primary inter-discipline frequency (**GOLD**) remains at the first inter-discipline level of communications.

Part IV: Law Enforcement

Introduction & Purpose

The law enforcement mutual aid system is an ongoing cooperative effort among law enforcement agencies to ensure an effective and organized response to a wide range of emergencies. This document establishes policies and procedures for the use of Montana's law enforcement mutual aid radio frequencies. According to Montana Codes Annotated (MCA) §2-17-542, the Montana Department of Administration is vested with the authority to develop and maintain a land mobile public safety radio frequency utilization plan, as reflected in these policies and procedures for Montana law enforcement mutual aid frequencies. Purposes, eligibility, usage, codes, operations, requirements, discipline and oversight are covered in this section.

Mutual aid radio planning for law enforcement recognizes the extensive use of closed systems while accommodating interagency communications needs, which requires law enforcement agencies to coordinate their communications carefully with other public safety agencies. Law enforcement is typically the center of public safety response in Montana and has found it necessary to allow other response agencies access to its systems for interoperability.

Mutual aid radio can help provide communications between different jurisdictions, types of responders, and levels of government. It cannot, however, replace standard, "private" channels for common operational needs. For example, many county sheriffs work closely and regularly with city police within their jurisdictions. Sharing of their respective systems may be required for adequate coverage and accessibility.

Mutual aid channels should be used to supplement these common operations, allow access for special incidents, and provide for critical backup.

Dispatch operations are appropriately conducted on "private" channels: not mutual aid. Only the Montana EMS Frequencies Plan (Part V) provides shared frequencies for dispatch and paging. If an agency or organization is regularly dispatched by a communications center, then a non-mutual aid channel should be available for this purpose. Although communications between a center and responders may be appropriately channeled to mutual aid frequencies during a response event, initial dispatch is not. Montana's mutual aid radio users are asked to conserve these resources to make them widely available when most needed.

FCC Eligibility Requirements

Police agencies seeking to use the Montana law enforcement mutual aid frequencies must meet Federal Communications Commission (FCC) eligibility requirements as follows:

> FCC §90.20 (a) - Eligibility. (1) Any territory, possession, state, county, city, town or similar governmental entity is eligible to hold authorizations in the Public Safety Pool to operate radio stations for transmission of communications essential to official activities of the licensee, including: (ii) A governmental institution authorized by law to provide its own police protection.

Montana Law Enforcement Mutual Aid Frequencies

Three frequencies (**BLUE**, **SILVER** and **BLACK**) are established for law enforcement use and are summarized in Table 12 below. A fourth frequency, **GOLD**, is established for general public safety use, including law enforcement. The color designations are offered here as a simple naming convention for the different channels. They are used in this document where the actual frequency or descriptive name is not needed. Three classes of law enforcement mutual aid traffic considered here are for emergency, administrative, and tactical communications.

Table 13: Montana Mutual Aid Law Enforcement Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
Emergency Communications				
155.4750	**BLUE**	VLAW31	National Law Enforcement Emergency	• Secondary status to Canadian RCMP stations along the border • Requirement for receiver tone control (156.7 Hz) effective Oct. 1, 2012
Administrative Communications				
155.7900	**SILVER**	None	Law Enforcement Mutual Aid	Requirement for receiver tone control (156.7 Hz) effective Oct. 1, 2012
153.9050	**GOLD**	None	General Mutual Aid and Coordination	
Tactical Communications				
153.8000	**BLACK**	None	Law Enforcement Tactical	• Approved digital and encrypted use with regional SOP • Requirement for receiver tone control (156.7 Hz) effective Oct. 1, 2012 • Not to be used within 75 miles of the BLAIRMORE, HILLCREST & WARNER, ALBERTA areas per FCC license

Emergency Communications

Purpose

The **BLUE** channel (National Law Enforcement Emergency) is the primary channel for law enforcement interagency emergency communications. The purpose is to establish a statewide law enforcement emergency communications network under FCC Rules and Regulations, Part 90.20, using the frequency 155.4750 MHz. It is established by authority of MCA §2-17-542.

BLUE is used for initial contact on more routine matters. Short, infrequent transmissions make it most available for sudden emergency traffic. It must be monitored widely to be of most value.

In instances where continued or tactical interagency communications are needed at an incident, initial contact may be made on the **BLUE** channel and responders instructed to move to the **SILVER** channel. For example, at a vehicular accident scene **BLUE** could be used to summon other law enforcement responders and direct them to **SILVER** for continued operations. If necessary, emergency operations may be conducted on the **BLUE** channel, but an attempt should be made to off-load them as much as possible for other sudden emergencies.

Eligibility

Here are the entities and eligible uses for the **BLUE** channel within Montana. Additional rules and regulations affecting eligibility may be established by the Department of Administration in consultation with the Law Enforcement Advisory Council.

- **State of Montana**: The State of Montana, Department of Administration shall maintain a statewide, fixed base and mobile license for this frequency to allow other eligible users mobile and/or temporary base station access by agreement. The State shall maintain all base station authorizations on this frequency under its license.

- **Law Enforcement**: Except for itinerant federal law enforcement vehicles, a law enforcement agency must be a licensee in the police or local government radio service in order to be eligible to use this frequency.
    - **Bases**: Any law enforcement agency in the state meeting the above conditions shall be eligible to obtain base station authorization under the State's license on this frequency, subject to applicable FCC Rules and Regulations. All 24-hour law enforcement communications centers will be encouraged to install bases on 155.4750.
    - **Mobile**: Any law enforcement agency may enter into agreement with the State of Montana to be included under its mobile license.

- **Others:** The only non-law enforcement users allowed access on the **BLUE** channel are bus services and ambulances to communicate directly with law enforcement. These two groups were provided with special access because they frequently cross jurisdictional boundaries and may need contact with a variety of law enforcement agencies, particularly dispatch centers. Under no circumstances may they have base stations on these frequencies.

    - **Buses:** Buses may use the **BLUE** channel only during a locally declared disaster or emergency as specified in a jurisdiction's Emergency Operations Plan or a state or federally declared disaster or emergency. Other restrictions are:
        - The bus service must be included in the local/regional Emergency Operations Plan.
        - The bus service must provide student transportation for recognized Montana school districts, colleges, universities, or local government entities. Private bus contractors may operate under a district's authorization while serving that district.
        - A school district must enter into agreement with the Department of Administration for statewide mobile use of the **BLUE** channel in its buses.

- Access must be authorized in writing by the district's local sheriff.
- **Note**: If a bus driver needs to interface with public safety officials, **GOLD** is the recommended channel. Administrative bus traffic is not allowed on ANY mutual aid channel.

- **Ambulances:** Ambulance services seeking to use the **BLUE** channel must be licensed as such by EMS & Trauma Systems Section of the Department of Public Health and Human Services. Access to the **BLUE** channel is neither intended for all EMS providers nor as a substitute for local operational channels. Ambulance services may enter into agreement with the Department of Administration to be included under its mobile license for statewide use of the **BLUE** channel.

Frequency Usage

The Montana law enforcement emergency communications network is established exclusively for interagency emergency and itinerant law enforcement communications.

Administrative Communications

Purposes

The **SILVER** channel is established as the primary frequency for law enforcement interagency administrative communications. It is used for dispatch-to-dispatch communications and tactical operations. **GOLD** and **SILVER** are established by authority of MCA §2-17-542 and in accordance with FCC Rules and Regulations, Part 90.20, using the frequencies 153.9050 MHz (**GOLD**) and 155.7900 MHz (**SILVER**). **Note: SILVER** is not regularly used in the City of Billings due to interference problems.

The **GOLD** channel is for inter-discipline communications (law enforcement-fire, law enforcement-highway department, etc.) It is used for both emergency and administrative (non-emergency) traffic, subject to priority use levels. (See Priority Use Levels on Page 3). Administrative traffic is appropriately carried on **SILVER** or **GOLD** channels unless preempted by a higher priority need. Ambulances and public bus service providers have been given access to the **BLUE** channel for emergency contacts with law enforcement base stations, but are expected to use the **GOLD** channel otherwise.

Eligibility

Here are the entities and eligible uses for the **SILVER** channel within Montana, subject to applicable FCC Rules and Regulations. Additional rules and regulations affecting eligibility may be established by the Department of Administration in consultation with the Law Enforcement Advisory Council.

- **State of Montana:** The State of Montana, Department of Administration shall maintain a statewide mobile license for this frequency to allow other eligible users mobile access by agreement. It may license base stations on this frequency for state law enforcement agency use consistent with this plan.
- **Law Enforcement:** Except for itinerant federal law enforcement vehicles, a law enforcement agency must be a licensee in the police or local government radio service in order to be eligible to use this frequency.
    - **Bases:** Any law enforcement agency in the state meeting the above conditions and having a base station installed on the frequency 155.4750 MHz shall be eligible to license a base station on this frequency.
    - **Mobile:** Any law enforcement agency in the state meeting the above conditions shall be eligible to obtain a mobile license on this frequency for use within its jurisdiction. Law enforcement agencies may enter into agreement with the State of Montana for statewide mobile use authorization.

Frequency Usage

The Montana law enforcement mutual aid frequency is established exclusively for law enforcement dispatch-to-dispatch communications and tactical operations.

a. Itinerant Traffic

Itinerant traffic such as between a prisoner transport vehicle and a communications center enroute should be carried on the **SILVER** channel. If necessary, initial contact may be made on the **BLUE** channel, but it should be transferred as soon as possible to **SILVER** where administrative and tactical traffic is appropriate.

b. Point-To-Point

The **SILVER** channel may also be used for point-to-point (base-to-base) communications. FCC §90.417 and 90.419 authorize interstation communications between different licensees "when the communications involved relate directly to the imminent safety of life or property," on a secondary basis to base-mobile or mobile-mobile operations. This regulation applies to all fixed stations on public safety frequencies commonly used in Montana; not just mutual aid.

Agencies must license their own base stations on the **SILVER** channel. The State of Montana maintains a statewide mobile license for this frequency and can directly authorize mobile use. No authorization by agreement is available for base station installation. Licensure by agencies is subject to coordination by the Montana Frequency Advisory Committee (MFAC) of APCO and is contingent upon prior installation of a **BLUE** base station.

As coordinator of police and local government frequencies in the state, the MFAC may recommend changes to limit range or harmful interference potential. A law enforcement mutual aid radio oversight council to the Department of Administration will arbitrate if MFAC and the applicant agency cannot find a mutually acceptable solution.

No special technical restrictions are established for **SILVER** base stations, but agencies making application should design their systems to minimize nuisance interference. Sub-audible tone selection of receivers is not allowed for most mutual aid and is discouraged for common frequencies. Toning reduces interoperability and negates much of the rationale behind mutual aid.

Tactical Communications

Purpose

The **BLACK** channel is established only for interagency, law enforcement tactical team communications within Montana; other use is strictly prohibited. It is established by authority of Montana Codes Annotated §2-17-542 and in accordance with FCC Rules and Regulations, Part 90.20, using the frequency 153.800 MHz.

The **BLACK** channel is not available for base station use and is intended primarily for portable-to-portable communications, but it may be placed in mobiles that support coordination of tactical operations (e.g. command post vehicles). The frequency is used in fixed stations by Judith Basin County and the Town of Drummond; these stations are considered primary users if interference arises. Mutual aid users must avoid interference with these existing licensees.

Eligibility

Here are the entities and eligible uses for the **BLACK** channel within Montana, subject to applicable FCC Rules and Regulations. Additional rules and regulations affecting eligibility may be established by the Department of Administration in consultation with the Law Enforcement Advisory Council.

- **State of Montana:** The State of Montana, Department of Administration, shall maintain a statewide mobile license for this frequency to allow other eligible users mobile access by agreement.
- **Law Enforcement:** Except for itinerant federal law enforcement units, a law enforcement agency must be a licensee in the police or local government radio service to be eligible to use this frequency.

- **Bases:** No permanent base stations are allowed on this frequency for mutual aid use. Existing stations in Judith Basin County and the Town of Drummond shall maintain primary user status in those jurisdictions.
- **Mobile:** Any law enforcement agency in the state meeting the above conditions may enter into agreement with the State of Montana for authorization under its mobile license.

Frequency Usage

The Montana law enforcement tactical team coordination frequency is established exclusively for law enforcement tactical team operations. It is intended for use in portable radios and may only be used in vehicular radios in support of tactical team operations.

Encryption

In general, the use of any mutual aid channel for transmission of any encoded, encrypted, digital, or scrambled message is prohibited. One exception, however, is with the **BLACK** channel where encryption may be utilized in combination with a regional plan. The Montana Highway Patrol retains the law enforcement common encryption key.

Operations & Permissible Uses

The following operational requirements and procedures are established to make most effective use of the Montana law enforcement mutual aid frequencies.

The phrase "letter of authorization" as used in this section is meant to include any formal agreement adopted by the Department of Administration for use with mutual aid radio frequencies. Nothing in this section should be construed as prohibiting the installation of any frequency for receive-only operations (monitoring).

Police agencies seeking to install a base station on the **BLUE** frequency must have a letter of authorization from the Department of Administration and post a copy of the State's FCC license covering the installation as required by FCC §90.437.

before commencing operations. Agencies are bound by agreement to all applicable FCC rules and regulations.

Police agencies seeking to install a base station on the **SILVER** frequency must have an FCC license authorizing such installation before commencing operations. Agencies are bound by law to all applicable FCC rules and regulations. Installation of a base station on the **BLUE** frequency is required before license applications for this frequency will be approved by state authorities.

Police agencies seeking to use the **BLUE, SILVER, or BLACK** channels in mobile or portable radios must provide an accurate estimate of the number of intended installations and must receive a letter of authorization from the Department of Administration before commencing operations. Alternately, an agency may license the **SILVER** frequency directly with the FCC for mobile use within its jurisdiction.

Three usage classes are presented in Table 14 on the following page along with their permissibility. All communications are considered two-way.

Table 14: Usage Classes

Mutual Aid Channel	Base - Mobile	Base - Base	Mobile - Mobile
BLUE	YES	NO	YES
SILVER	YES	YES	YES (secondary)
BLACK	NO	NO	YES

Frequency Monitoring

Users of any mutual aid frequency are required to monitor the frequency prior to transmitting to detect higher priority traffic. When need be, an "EMERGENCY TRAFFIC" interruption or "EMERGENCY TRAFFIC ONLY" broadcast may be made.

Agencies with **BLUE** base stations installed must monitor the frequency at all times when their facility is operational. A separate receiver for this frequency is encouraged to prevent other traffic or transmissions from covering it. Mobile monitoring of the channel at all times by all users is encouraged as well.

Itinerant Services: All users of these frequencies must render service to itinerant vehicles on the frequencies as such traffic relates to the provision of public safety.

Continuous Tone-Coded Squelch System (CTCSS)

Continuous Tone-Coded Squelch System (CTCSS) is also known by various trade names such as Private Line or PL (Motorola), Channel Guard (GE) and Quiet Channel (E.F. Johnson). It is used to reduce the annoyance of listening to other users on a shared two -way radio communications channel and is sometimes called "tone squelch." The system superimposes a sub-audible audio tone on a carrier for the purpose of eliminating co-channel interference.

CTCSS tones are standardized by the Electronic Industries Alliance (EIA)/Telecommunications Industry Association (TIA) and may be listed in equipment manuals. Two receiver tones are used for interoperability nationwide: 156.7 and 167.9 Hz.

Effective Oct. 1, 2012, **BLUE**, **SILVER,** and **BLACK** will utilize a common receive CTCSS tone of 156.7 Hz to protect these channels from interference from adjacent users. The law enforcement mutual aid council has also authorized the use of digital Network Access Codes (NAC) on **BLACK** on an incident-specific basis in accordance with local law enforcement communication plans.

Oversight & Discipline

A council consisting of one representative from each of the following organizations provides oversight for law enforcement mutual aid radio to the Department of Administration:

- Montana Sheriffs and Peace Officers Association
- Montana Association of Chiefs of Police
- Montana Highway Patrol (MHP) **Note:** MHP is responsible for representing all State of Montana law enforcement users.
- An optional member may be selected from the Association of Public Safety Communications Officials (APCO)/Montana Frequency Advisory Committee (MFAC) to provide technical advice and direction.

The policies and procedures established here, combined with the FCC Rules and Regulations: Part 90, compose the usage guidelines for the Montana law enforcement mutual aid system. The Department Administration in consultation with the advisory council shall be vested with the authority to deal with frequency disputes.

Incident Communications Plans

The incident communications plans discussed here only address law enforcement and do not attempt to cover all the resources available within any given jurisdiction. More general plans for other public safety services are covered in Part I: "General Information".

1. Basic Interagency Operations

Basic interagency law enforcement operations are conducted on the **SILVER** channel. As noted above, use of the **BLUE** channel should be limited to interagency emergency and base-mobile communications. It may be used for initial contact on non-emergency matters, but traffic should be switched as soon as possible to one of the tactical mutual aid (**SILVER**, usually, for law enforcement) or local common coordination channels, if available.

While the **GOLD** channel (State Common Mutual Aid) has been used a great deal in the past for law enforcement-to-law enforcement traffic, it should be reserved for inter-discipline communications where it is likely the only shared frequency. Ambulances and public bus service providers have been given access to the **BLUE** channel for emergency contacts with law enforcement base stations, but are expected to use the **GOLD** channel otherwise.

A basic communications plan for law enforcement would have agencies using their own channel(s) between their own units, the **SILVER** channel for contact between like units (mobile-mobile, base-base), the **BLUE** channel for interagency base-mobile contacts, and the **GOLD** channel for inter-discipline mobile-mobile communications. Graphically, it may be depicted as appears in Figure 5 on the following page.

Figure 5

The agencies' own communications channels are not diagrammed here and some complementary lines (e.g. ambulance to sheriff's office mobile) are left out for the sake of clarity.

The remainder of the plans discussed here closely follows Incident Command System (ICS) structure. ICS is an effective tool for the management of emergency operations. It uses concepts of common terminology, modular organization, integrated communications, unified command structure, and manageable span-of-control, among others, all of which are keys to successful operations. Even in simple incidents, ICS may be put to work.

When an incident commander (IC) is designated during an event or operation, it is useful to have a separate net for command communications. This net would be used for direct control of operational elements during a simple incident. For an example, see Figure 6 below.

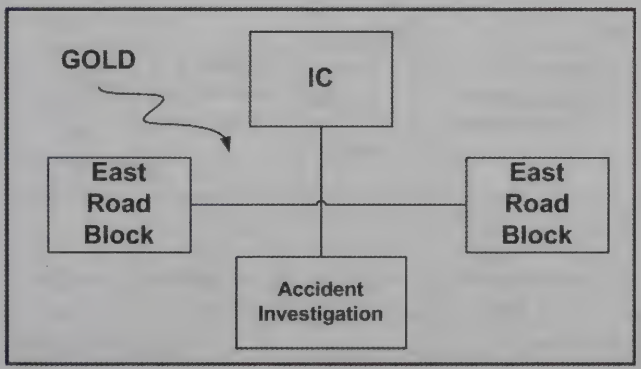


Figure 6

The **SILVER** channel could be used for the command net during purely law enforcement operations, but use of the **GOLD** channel will simplify expansion of a communications plan in the likely event that other types of public safety services are needed. **SILVER** could be retained for interagency tactical communications, such as in Figure 7 below.

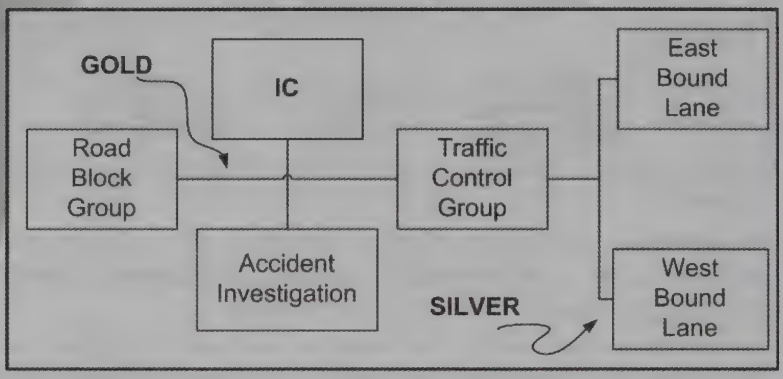


Figure 7

When multiple units of an agency are involved, one of that agency's working channels becomes (or remains) its tactical channel. For example, see Figure 8 where A and B are the agencies' own working channels

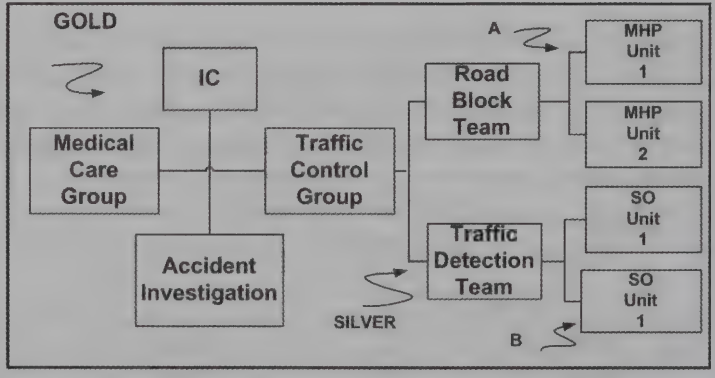


Figure 8

A simple incident where a single ambulance or highway sander, say, is also involved is easily handled by placing it on the command net (**GOLD**). If the situation expands much beyond that, a more complex plan is needed.

2. Extended Incidents

Extended incidents require both more formal communications plans and a broader network to cover a variety of response agencies. No mutual aid radio plan will be able to provide all the communications necessary in a large incident where police, fire, EMS, search and rescue, and road maintenance workers among others may converge. Communications preplanning, taking into account all available resources, is essential for adequate response to such emergencies. Through this process, a formal plan can be developed that puts mutual aid radio to best use.

A generalized mutual aid plan is covered in Part I, "General Information" above. It establishes the **SILVER** channel for the first level of interagency law enforcement communications in both basic and extended incidents. In an incident command system, the **GOLD** channel is used at the highest operational level. In many cases it would be used by the incident commander (IC) to direct the various types of resources (fire, EMS, law enforcement, etc.) that respond.

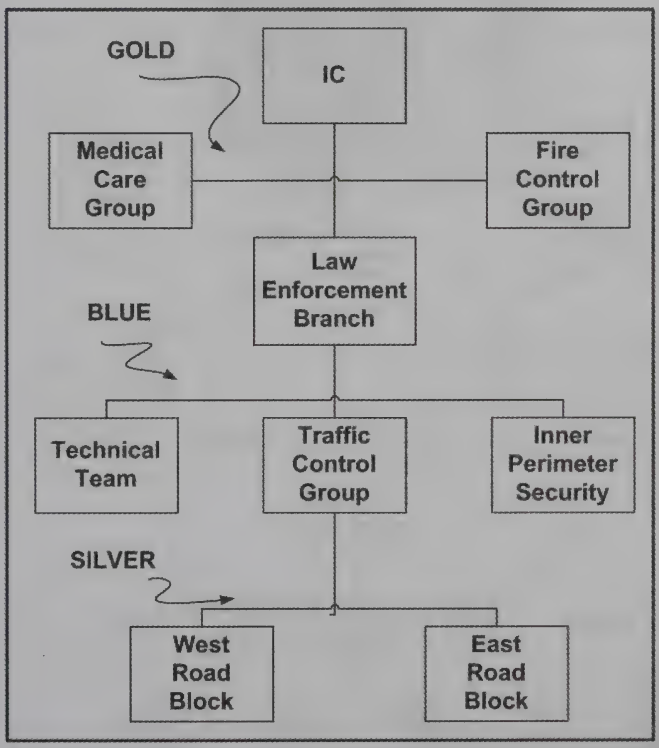


Figure 9

When an extended law enforcement command net is needed as an incident grows, the **BLUE** channel is inserted above **SILVER**, with the latter being retained at the first interagency communications level. For example, the previous plan could be modified as below, focusing on law enforcement and excluding the individual units (See Figure 9 on the previous page).

As an incident becomes more complex, operations are likely to be split from other command functions and an operations section chief assigned. The **GOLD** channel would continue to serve as the primary inter-discipline command net, while a new frequency would be assigned for incident command communications between the command staff and each functional section chief. The **BROWN** channel (State DES Direction and Control) would be appropriately used.

A large-scale incident communications plan may appear as depicted in Figure 10, with emphasis on the law enforcement structure.

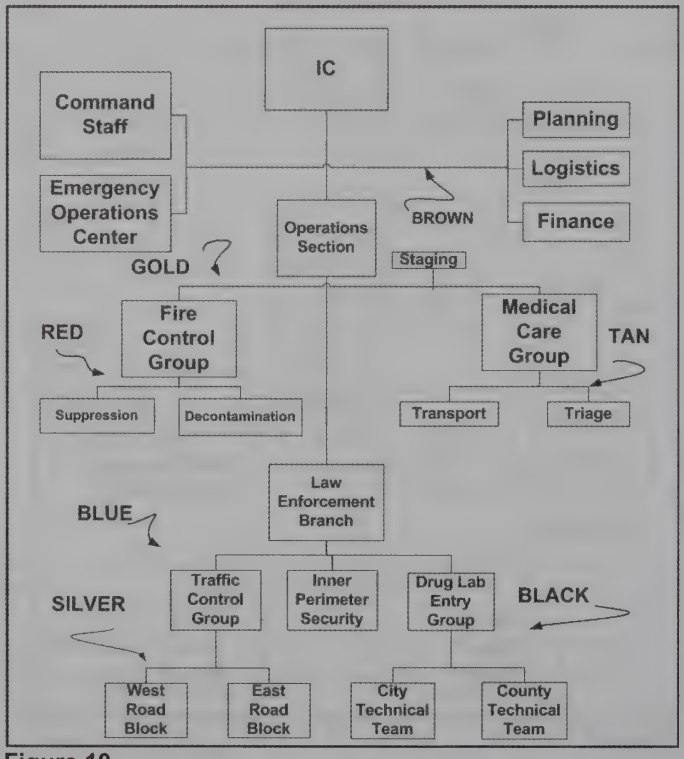


Figure 10

The need to incorporate individual agencies' working frequencies into these plans cannot be overstated. Incidents regularly occur where direct base-mobile communications are impossible and mobile relay (repeater) systems are required. Mutual aid frequencies are generally unavailable for use in repeaters, so such access will be through systems and frequencies maintained by the involved agencies.

Provisions should be made to give the various types of responders within a jurisdiction access to the wide-area networks covering the jurisdiction for maximum coverage and flexibility in formulating a communications plan.

Part V: Fire Services

Introduction

Montana has nearly 400 fire service entities—with more diverse emergency response organizations than law enforcement, EMS, and Search and Rescue (SAR) organizations combined. Most of these fire services have one or more radio frequencies licensed for their use within their own jurisdictions. Many also have access to local coordination radio systems, often using mobile relays (repeaters). Mutual aid and common frequency use can supplement locally licensed systems and provide much needed communications interoperability.

This document establishes policies and procedures for the use of Montana's fire mutual aid radio frequencies, interagency itinerant and emergency communications within Montana. According to Montana Codes Annotated (MCA) §2□17-542, the Montana Department of Administration is vested with the authority to develop and maintain a land mobile public safety radio frequency utilization plan, as reflected in these policies and procedures. Purposes, eligibility, usage, codes, operations, requirements, discipline and oversight are covered in this section.

Montana Fire & General Use Mutual Aid Frequencies and Usage

The Montana fire mutual aid frequencies are established exclusively for interagency emergency and itinerant fire services communications. Nine fire service mutual aid frequencies are listed in Table 15 on the following page along with three other frequencies, **GOLD, TAN** and **NEON**, which have been established for general public safety use, including fire services. Once again, the color designations presented here are used as a simple naming convention. They are used in this manual in place of the actual frequency or descriptive name.

Table 15: Montana Mutual Aid Fire/General Use Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
Fire Mutual Aid Frequencies				
153.8300	**RUBY**	None	State Fire Repeater	
154.0700	**RED**	None	State Fire Mutual Aid	Not to be used within 75 miles of Bow Island, Alberta per FCC license
154.2800	**MAROON**	VFIRE21	State Command and Control	
154.2650	**CORAL**	VFIRE22	State Fire Ground #1	
154.2950	**SCARLET**	VFIRE23	State Fire Ground #2	
154.2725	**COPPER***	VFIRE24	State Fire Ground #3	• Maximum mobile power is 100 watts ERP • Narrowband Only • Secondary to adjacent 7.5kHz licensed channels where applicable • Special permission required for use

* ***NEW*** Fire Tactical Frequency

Table 15: Montana Mutual Aid Fire/General Use Frequencies *(continued)*

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
Fire Mutual Aid Frequencies *(continued)*				
154.2875	**BURGUNDY***	VFIRE25	State Fire Ground #4	• Narrowband Only • Secondary to adjacent 7.5 kHz licensed channels where applicable • Special permission required for use
154.3025	**CRIMSON***	VFIRE26	State Fire Ground #5	• Narrowband Only • Secondary to adjacent 7.5 kHz licensed channels where applicable • Special permission required for use
159.3450	**GARNET**	None	State Fire Repeater Control	
General Use Frequencies				
153.9050	**GOLD**	None	General Mutual Aid and Coordination	

* ***NEW*** Fire Tactical Frequencies

Table 15: Montana Mutual Aid Fire/General Use Frequencies *(continued)*

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
General Use Frequencies *(continued)*				
155.3400	**TAN**	VMED28	**Primary Use**: State Air-to-Ground Coordination **Secondary Uses:** EMS communications and medical staging at an incident scene.	10-Watt Airborne Limit restricted to under 5280 feet
157.4250	**NEON***	None	General Mutual Aid and Coordination **Note:** EMS Priority during mass-casualty incidents. On-scene incident management per SOP (Triage Group)	• Narrowband Only • 40-Watt Mobile Limit • Use above Line A requires special FCC approval through the Dept. of Administration
			• *Not available within 120 Km of Coutts, AB including the following jurisdictions: the Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties.* • *Not available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties as well as the Fort Peck Reservation due to co-channel use.*	

* ***NEW*** Fire Tactical Frequency

Different uses are intended for each of the mutual aid frequencies, as described below.

RUBY and **GARNET** are licensed for temporary mobile relay and control station use, respectively. The **RUBY** channel is for the State Fire Repeater and is meant to be paired for mobile relay use with the **GARNET** channel, the State Fire Repeater Control channel. **RUBY** (153.8300 MHz) is the output frequency of the relay (or fixed base for talk-around use) and **GARNET** (159.3450 MHz) is the control or input frequency to the relay. The primary use of these channels is for mobile-mobile communications.

RED is the primary fire tactical channel and should be the first choice for on-scene interagency communications. In many instances this channel will provide all the interoperability needed for communications between different organizations. It was first designated in 1984 for Montana mutual aid radio.

The **MAROON** channel is for interagency dispatch and multi-agency command and control. Its primary use is for base-mobile communications. It is a shared operational resource between fire organizations and agencies. Hence, overlapping coverage of base stations and interference to some degree is anticipated. This channel is to be used for directing diverse resources to large-scale incidents as well as for on-scene command when not tied up with base-base traffic. The **MAROON** channel is commonly used for fire mutual aid by surrounding states and is an additionally valuable resource.

The **CORAL, SCARLET, COPPER, BURGANDY, and CRIMSON** channels are additional fire ground channels. They are available for on-scene interagency communications where incident scope requires additional ground channels. The **COPPER**, **BURGANDY,** and **CRIMSON** channels are narrowband only and require a special permit prior to use.

The **GOLD** channel also is available to all Montana public safety and emergency responders and is designated for inter-discipline communications (fire-EMS, EMS-search and rescue, fire-law enforcement etc.). The **GOLD** channel is used for emergency and administrative (non-emergency) traffic, subject to priority use levels. Administrative traffic is appropriately carried on the **GOLD** channel unless preempted by a higher priority need.

The **TAN** channel is newly designated as the statewide Air-to-Ground coordination communications frequency for use by rotary or fixed wing aircraft with ground response units at emergency scenes. Its use includes landing assistance and emergency coordination. Secondary uses of this frequency are for Hospital-to-Hospital and Hospital-to-Ambulance communications or for EMS interagency communications at an incident scene. Please note that all airborne use of this frequency is restricted to below 5280 feet and 10-watt ERP.

The **NEON** channel is a General Use, narrowband-only frequency and was obtained through the Department of Administration's purchase of inland VPC (marine channel) rights, and is subject to restrictions according to the three licenses held by the State of Montana. Hence, the **NEON** channel is subject to a 10-Watt Airborne Limit and a 40-Watt Mobile Limit. It also is restricted to use under 5280 feet. Use above Line A (75 miles south of the Canadian border) requires special FCC approval through the Department of Administration. It is not available within 120 Km of Coutts, Alberta including the following jurisdictions: The Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties. Nor is it available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties or the Fort Peck Reservation.

Common Frequencies

Additional frequencies used by some large fire services are available through interagency agreement or, in some cases, by direct licensing. These are presented in Table 16 below.

Table 16: Common Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
155.8200	**BROWN**	None	State DES Direction and Control	
171.4750	**GREEN**	None	State/Federal Common	May be licensed by state forestry and conservation agencies and any others requiring access to the state (radio) system.

The State DES Direction and Control (**BROWN)** frequency is available for licensing by those qualifying within the Local Government and Special Emergency Services. It has a specific function in Montana's public safety radio plans and is not for general fire use, but may be valuable to have programmed in radios. The State/Federal common (**GREEN)** frequency can be of value, but may *only* be used through an agreement with that agency.

Many areas of the state have their own "common" channels for coordination of different resource groups, sometimes just fire organizations, sometimes all emergency responders. These channels should be used fully with provisions made for communications to outside resources, generally through use of mutual aid channels. Mutual aid radio should not be relied on in place of adequate planning and utilization of local resources.

Eligibility

Except for federal entities, a fire protection organization or agency must be an FCC licensee in the fire or local government service to be eligible to use these mutual aid frequencies. In addition, any public safety agency is eligible for authorization by agreement for any fire mutual aid frequency for multi-disciplinary operations.

Fire organizations or agency licensees are bound by law to all applicable FCC rules and regulations. Those seeking to use Montana fire mutual aid frequencies must meet FCC eligibility requirements, as listed below:

> FCC §90.20 (a) - Eligibility. Any territory, possession, state, city, county, town or similar governmental entity is eligible to hold authorizations in the Public Safety Pool to operate radio stations for transmission of communications essential to official activities of the licensee, including. . . persons or organizations charged with specific fire protection activities.

Licensing and Authorization

Authority for use of Montana fire mutual aid frequencies is obtained through licensing with the FCC and by agreement with the Department of Administration. Electronic requests for authorization may be submitted at this site: **https://app.mt.gov/mutualaid/instruct.html**. Permits are issued electronically.

Department of Administration can provide mobile use authorizations to fire service entities already licensed in the fire or local government FCC services. It also can provide authorization to establish temporary base, mobile relay and control stations for special incidents. FCC regulations require that any station intended to be operated for a year or more be permanently licensed at the specific site. However, the **CORAL, SCARLET, COPPER, BURGANDY,** and **CRIMSON** frequencies are mobile only and should not be used in base stations.

The entities and eligible uses for fire mutual aid frequencies within Montana are provided in Table 17 below. Operational licensing requirements are outlined so that Montana fire mutual aid frequencies may be used effectively. Additional rules and regulations affecting eligibility may be established by the Montana Department of Administration in consultation with the Mutual Aid Fire Advisory Council.

Table 17: Eligible Entities and Licensing of Fire/General Use Mutual Aid Frequencies

Channel Name	Eligibility	State of Montana Dept. of Administration	Fire Protection Organization or Agency*
RUBY	**Bases**	Licensed statewide for temporary fixed base use and permanent mutual aid repeaters	• Permanent base station use must have an FCC license authorizing such installation before commencing operations. • Paired with **GARNET** for mobile relay use by permit. (**GARNET** must be the input or mobile transmit frequency.)
	Mobile	Licensed statewide for mobile and mobile relay use.	• Available for installation in mobiles by permit. • Permanent mobile relays may be licensed directly with the FCC.

* Must be a licensee in the fire or local government FCC service in order to be eligible to use these frequencies. In addition, any public safety agency is eligible for authorization by agreement for any fire mutual aid frequency for multi-disciplinary operations.

Table 17: Eligible Entities and Licensing of Fire/General Use Mutual Aid Frequencies *(continued)*

Channel Name	Eligibility	State of Montana Dept. of Administration	Fire Protection Organization or Agency
RED, CORAL, and SCARLET	**Bases**	Not licensed for base station use.	Base station licensing after Nov. 1, 1989 on these frequencies is expressly prohibited.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit. Mobile licensing by individual entities has not been allowed since Nov. 1, 1989.
MAROON	**Bases**	Licensed statewide for temporary fixed base use.	• Permanent base station use must have an FCC license authorizing such installation before commencing operations. • Operations must be primarily base-mobile communications.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit.

Table 17: Eligible Entities and Licensing of Fire/General Use Mutual Aid Frequencies *(continued)*

Channel Name	Eligibility	State of Montana Dept. of Administration	Fire Protection Organization or Agency
GARNET	**Bases**	Licensed statewide for temporary control station use.	• Available for installation in temporary control stations by permit. • Permanent base or control station licensing by individual fire service entities is expressly prohibited.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit.
COPPER, BURGANDY, CRIMSON, and NEON	**Bases**	Not licensed for base station use.	Not available for base station use.
	Mobile	Licensed statewide for mobile use.	Available for installation in mobiles by permit.

Three usage classes are charted in Table 18 below with their permissibility—all communications are considered two-way.

Table 18: Permissible Uses of Fire/General Use Mutual Aid Frequencies

Channel Name	Base - Mobile	Base - Base	Mobile - Mobile
RED	NO	NO	YES
CORAL	NO	NO	YES
SCARLET	NO	NO	YES
RUBY	YES	NO	NO
GARNET	YES	NO	YES
MAROON	YES (secondary)	YES (secondary)	YES (secondary)
COPPER	NO	NO	YES (secondary)
BURGANDY	NO	NO	YES (secondary)
CRIMSON	NO	NO	YES (secondary)
NEON	NO	NO	YES (secondary)

Frequency Monitoring

Nothing in this section should be construed as prohibiting the installation of any frequency for receive-only operations (monitoring). Users of any mutual aid frequency are required to monitor the frequency prior to transmitting to detect higher priority traffic. When need be, an "EMERGENCY TRAFFIC" interruption or "EMERGENCY TRAFFIC ONLY" broadcast can be made.

All users of the fire mutual aid frequencies must render service to itinerant vehicles on the frequencies when such traffic relates to enhanced public safety.

Agencies with **MAROON** base stations installed should monitor the frequency at all times when their facility is operational. A separate receiver for this frequency is encouraged to prevent other traffic or transmissions from covering it. Mobile monitoring of the channel at all times by all users is encouraged as well.

Oversight & Discipline

An advisory council consisting of representatives as indicated from each of the following organizations/ agencies provides consultation for fire mutual aid radio to the Department of Administration:

- Department of Natural Resources and Conservation - one person
- Department of Justice, Fire Marshal Bureau - one person
- University System, Fire Services Training School - one person
- Montana State Volunteer Firefighters Association - two persons
- Montana Fire Chiefs Association - two persons
- A member of the Association of Public-Safety Communications Officials, Montana Frequency Advisory Committee, may be seated with the council for technical advice and direction.

The policies and procedures established here, combined with the FCC Rules and Regulations: Part 90, comprise the usage guidelines for the Montana fire mutual aid radio frequencies. Failure to abide by these policies and procedures could result in the removal of authority to operate on any mutual aid frequency.

The Department of Administration in consultation with the Fire Mutual Aid Radio Advisory Council shall be vested with authority to deal with complaints of abuse brought before it.

Incident Communications Plans

At the simplest incident, command/control communications are indistinguishable from tactical communications. The incident commander in such a case is directing resources (command/control) right down to the smallest working (tactical) level. Mutual aid radio is rarely needed in such minor incidents since one working frequency is generally adequate.

A distinction between tactical and command/control communications needs to be made as an incident grows and when communications traffic becomes too great for a single frequency. More than one radio frequency is needed to establish separate networks (nets) unless a medium other than radio is used for one or the other.

Any public-safety entity—fire service or otherwise—should have an adequate number of frequencies available to conduct operations not requiring interagency response. In other words, if a given fire organization needs multiple, separate nets for internal command, control, and tactical communications, it should have enough frequencies available to satisfy its own needs. Mutual aid radio cannot provide all the frequency resources for public safety response; it is intended for interagency communications. The best use of locally licensed frequencies must be made so that mutual aid frequencies are available when they are the only means of communications.

Fire communications plans offered here make use of these frequencies as intended by the FCC and this *Mutual Aid Manual*.

1. Basic Interagency Operations

The most basic communications plan for an interagency fire incident would use the **RED** channel for interagency traffic. Each organization would use its own channel for internal communications.

This communications plan is depicted in Figure 11. Although not shown in Figure 11, the **GOLD** channel may be appropriately used for check-in directly with the incident commander.

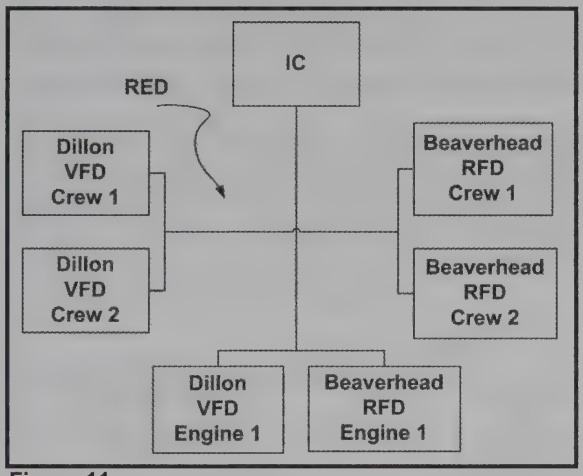


Figure 11

A slightly more complex plan is needed when interagency command must be separated from interagency tactical communications. Figure 12 on the following page shows a plan with a command net on **MAROON** between the incident command, a functional element (group) and geographic elements (divisions).

The **MAROON** channel is available for base station installation and is currently used by some inter-agency communications centers. It would appropriately be used in this scenario between the incident command and communications center for ordering resources in the initial stages of a response.

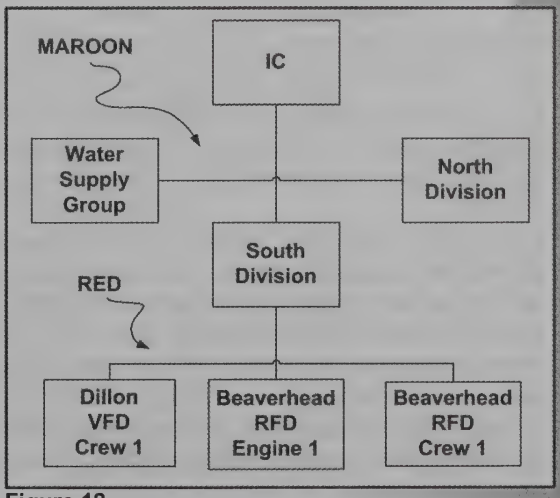


Figure 12

The example in Figure 12 is simplified by identifying individual resources provided by separate fire service agencies. The plans assume that additional organizational subdivisions may take place within the agencies, and their own frequencies will be useable for communications. Often times, though, strike teams are formed from different agencies and the "private" frequencies of each agency are useless within the group. Mutual aid frequencies are appropriate for this use, although limitations exist because of the number available.

Considering an incident involving only fire responders, a simple two -level command structure (with the IC managing operations) and a strike-team approach, a communications plan may look like the example shown in Figure 13.

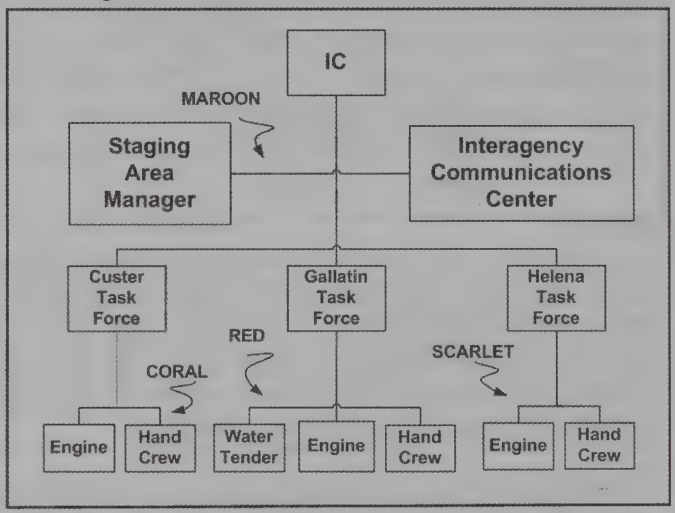


Figure 13

The **RED**, **CORAL**, and **SCARLET** frequencies are randomly assigned here for equivalent functions. No special order is followed, though **RED** should be geographically closest to powerful **MAROON** transmitters since the other two are adjacent channels to **MAROON** and may be subject to interference.

It would be risky, in a variation to the above plan, to reassign the **MAROON** channel to tactical use and to use, say, the **GOLD** channel for incident command. First, **MAROON** is most likely to have base stations transmitting on it, thus interrupting operations. Command personnel will likely be in a better position both geographically and functionally to call "EMERGENCY TRAFFIC ONLY" to get critical communications across; field personnel will more likely be using low powered transceivers, thereby reducing interference potential.

Second, if the incident escalates into a multi-discipline operation, the **GOLD** channel will be needed at the highest operational level and fire command would need to be moved to some other frequency. This scenario would be further complicated by the fact that the **MAROON** channel was assigned to tactical units; a switch to it as the command channel later in the incident could be problematic.

General mutual aid planning should take into account the likelihood of multi-agency strike teams being used. If it is likely, plans should be made to pool agencies' working frequencies for common use during situations as described above. The frequencies can be installed in radios of all cooperating agencies (as properly licensed) and a common channelization plan devised so that "Channel 1", for example, is the same in all units.

2. Extended Incidents

Fire incidents have a high potential for becoming inter-disciplinary in nature, involving EMS and law enforcement among others. Extended incidents as discussed here are those which involve other types of public safety services. They require additional planning for communications. The **GOLD** channel is the primary means of radio communication between different public safety service types.

The simplest inter-discipline incident may be one where the incident commander is directly responsible for fire operations as well as for coordinating EMS response. The IC would appropriately use the **GOLD** channel for communications with all tactical units.

As the situation becomes more complex, the incident commander is less responsible for fire inter-agency coordination and more responsible for inter-discipline coordination. A separate fire branch may be established and the communications plan extended smoothly, as illustrated in Figure 14.

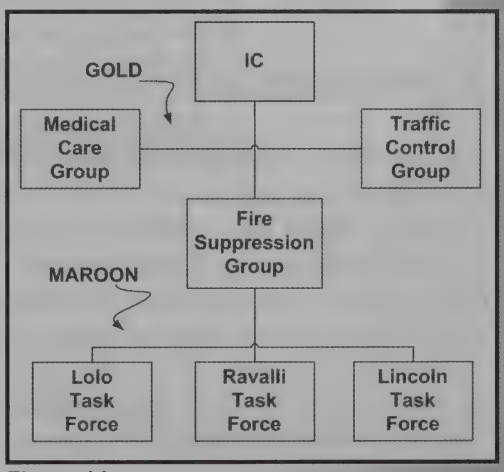


Figure 14

When direct operations responsibility is moved away from the incident commander and an operations section chief is instituted because of the incident complexity and scope, the communications plan can expand to include the use of the State DES Direction and Control (**BROWN**) channel. The most complex plan to be included here may appear as depicted in Figure 15.

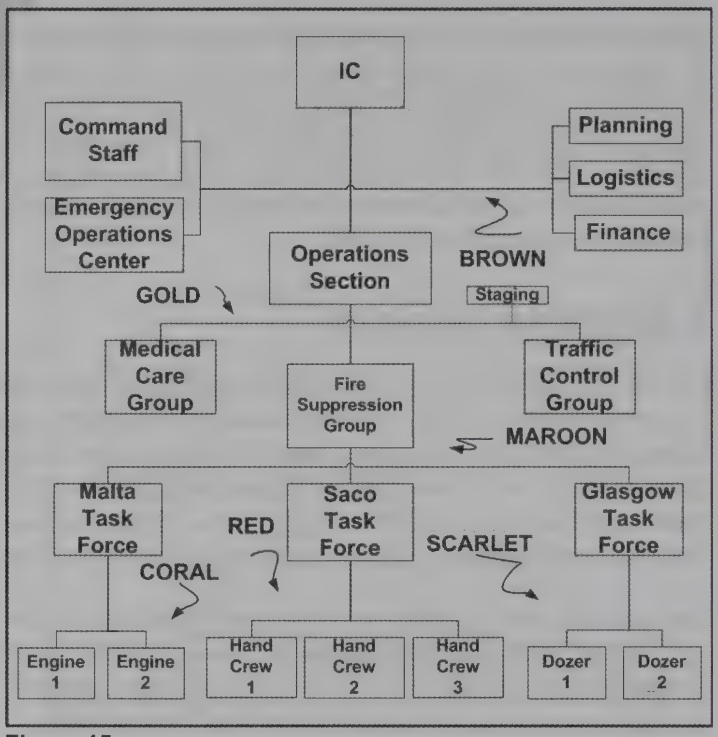


Figure 15

3. Geographically Extended Incidents

Geographically extended incidents are supported by mutual aid communications with the use of two frequencies for interagency fire repeaters. **RUBY** and **GARNET** are mutual aid channels that are available statewide for shared repeater use. With strategic placement of mutual aid repeaters, mobile and portable radio coverage may be extended over greater distances.

Repeaters not only offer greater mobile coverage, they also add complexities to communications plans and actual operations. Two frequencies are used per repeater channel and confusion may arise

over which is the mobile transmit and which is the repeater transmit. Other problems arise when repeaters use sub-audible tone or digitally-coded squelch as is required for **RUBY** repeaters to reduce interference. In addition, because they are usually sited high on mountains to provide the best coverage possible, repeaters also can cause interference at greater distances.

RUBY repeaters are suitable for command or tactical communications, interagency and even inter-discipline. Users are strongly encouraged to study the restrictions on **RUBY** and **GARNET** explained earlier in this manual and to further consult with their radio service providers before incorporating these frequencies into their plans. Permanent repeaters must be licensed with the FCC by the user and authorization to use **GARNET**, the repeater control frequency, is only available through permit with the State of Montana.

COPPER, BURGANDY, or **CRIMSON** may be used to expand operations in the above example above to manage task force and crew communications.

Part VI: Emergency Medical Services (EMS)

Introduction & Purpose

The purpose of this Emergency Medical Services (EMS) Frequencies Plan is to establish both a guide for EMS providers and an overview of requirements for local EMS systems to assure that a statewide communications system is in place to address daily needs as well as large-scale, multi-casualty situations.

This plan establishes statewide EMS common frequencies for medical and interagency itinerant and emergency communications within Montana. The frequencies 155.2800, 155.3400, 155.3250, and 155.3850 MHz are so established by authority of Montana Codes Annotated §2-17-312 and in accordance with Federal Communications Commission (FCC) Rules and Regulations, Part 90.

This document is intended to:

1. Assure coordination with dispatch of emergency medical service agencies;
2. Provide for Hospital-to-Ambulance and Ambulance-to-Ambulance radio communications;
3. Provide communications among all emergency medical services;
4. Provide for communications between medical response services and all other emergency response agencies;
5. Allow for coordinated mutual aid communications between medical units and other response agencies in the event of a major EMS incident; and
6. Be coordinated statewide to assure a good system with a minimum duplication of effort.

Eligibility

All Montana EMS providers licensed by the Dept. of Public Health and Human Services (DPHHS) are eligible to license the Special Emergency Radio Service frequencies 155.2800, 155.3400, 155.3250, and 155.3850 for the uses approved here. Further rules and regulations affecting eligibility may be established by the Department of Administration in consultation with the DPHHS.

Table 19: Montana Mutual Aid EMS Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
155.2800	**WHITE**	None	Hospital-to-Ambulance and Hospital-to-Hospital Communications	
155.3400	**TAN**	VMED28	**Primary Use**: State Air-to-Ground Coordination **Secondary Uses:** EMS communications and medical staging at an incident scene.	10-Watt Airborne Limit/ restricted to under 5280 feet
155.3250	**GRAY**	None	**Primary Use**: Central Region Dispatch & Paging **Secondary Use:** On-scene incident management per SOP *(Treatment Group)*	Not to be used within 75 miles of Fort MacLeod, Alberta per FCC license

Table 19: Montana Mutual Aid EMS Frequencies *(continued)*

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
155.3850	**PINK**	None	**Primary Use**: Western/Eastern Region Dispatch & Paging **Secondary Use:** On-scene incident management per SOP *(Transport Group)*	
157.4250	**NEON***	None	General Mutual Aid and Coordination **Note:** EMS Priority during mass-casualty incidents. On-scene incident management per SOP *(Triage Group)*	• 40-Watt mobile limit • Use above Line A requires special FCC approval through the Dept. of Administration • Narrowband Only
			• *Not available within 120 Km of Coutts, AB including the following jurisdictions: the Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties.* • *Not available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties as well as the Fort Peck Reservation due to co-channel use.*	

* ***NEW*** Fire Tactical Frequency

Three general use frequencies, **GOLD**, **TAN** and **NEON** have been established for general public safety use. These are listed in Table 20 below.

Table 20: Montana Mutual Aid General Use Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
153.9050	**GOLD**	None	General Mutual Aid and Coordination	
155.3400	**TAN**	VMED28	**Primary Use**: State Air-to-Ground Coordination **Secondary Uses:** EMS communications and medical staging at an incident scene.	10-Watt Airborne Limit restricted to under 5280 feet
157.4250	**NEON***	None	General Mutual Aid and Coordination	• Narrowband Only • 40-Watt Mobile Limit • Use above Line A requires special FCC approval through the Dept. of Administration
			• *Not available within 120 Km of Coutts, AB including the following jurisdictions: the Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties.* • *Not available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties as well as the Fort Peck Reservation due to co-channel use.*	

* ***NEW*** Fire Tactical Frequency

EMS Radio Programming Requirements

Administrative Rules of Montana require that ground ambulances have a VHF mobile radio with the frequencies listed in Table 17 programmed in it as well as the State Common Mutual Aid **GOLD** (153.9050 MHz) channel. Air ambulances must have a VHF portable radio with the Hospital-to-Ambulance **WHITE** (155.2800 MHz) frequency.

Non-transporting units must have the capability of providing at least one radio at every emergency medical scene programmed with a minimum of the following frequencies:

- **Frequency 155.2800 MHz (WHITE)**
- **Frequency 155.3400 MHz (TAN)**
- **Frequency 153.9050 MHz (GOLD) State Common Mutual Aid**

Frequency Usage

The Montana EMS common frequencies are established for EMS interagency emergency and itinerant communications. Here is a list of Montana's four EMS frequencies and three General Use frequencies and their primary and secondary uses:

Table 21: Montana EMS & General Use Mutual Aid Frequencies

EMS Frequencies	
WHITE 155.2800 MHz	**WHITE** is the primary Hospital-to-Ambulance and Hospital-to-Hospital communications frequency. It may be used by ambulances for communication with local, area or regional hospitals. This frequency is designated as the **WHITE** channel as part of a simple naming convention. Paging is not allowed on this frequency. Digital and encrypted are allowed if documented in the local communications plan. The ambulance must first contact the hospital unencrypted and move to the encrypted mode as appropriate. Radios should be monitored in the unencrypted mode.

Table 21: Montana EMS & General Use Mutual Aid Frequencies *(continued)*

EMS Frequencies (Continued)	
TAN 155.3400 MHz	**Primary Use** of this frequency is for Air-to-Ground coordination by EMS and other emergency responders. **Secondary Uses: TAN** is authorized for ground ambulance services and non-transporting medical units for mutual aid communications between units or for EMS interagency communications and staging at an incident scene. This frequency is used for medical staging of air and ground units at a major incident.
GRAY 155.3250 MHz	This frequency, designated as **GRAY,** is used in the central region (2A & 2B) of Montana for EMS paging and dispatch in the form of communication between an ambulance service or other EMS responding agency and dispatch. In Montana, the FCC has issued a waiver allowing alerting of EMS personnel on this frequency; however, **ONLY** EMS personnel may be alerted on this frequency. In addition, this frequency may not be used within 75 miles of Fort MacLeod, Alberta. **Secondary Use:** This frequency is for communications within the Treatment Group of the Medical Branch at a major incident.
PINK 155.3850 MHz	This frequency is used in the western and eastern region (1A, 1B, 3A, & 3B) as an EMS paging and dispatch frequency. This frequency is used to communicate between an ambulance service or other EMS responding agency and dispatch. In Montana, the FCC has issued a waiver allowing alerting of EMS personnel on this frequency; however, **ONLY** EMS personnel may be alerted on this frequency. This frequency is designated as the **PINK** channel. **Secondary Use:** This frequency is for communications within the Transport Group of the Medical Branch at a major incident.

Table 21: Montana EMS & General Use Mutual Aid Frequencies *(continued)*

General Use Frequencies	
GOLD 153.9050 MHz	**Primary Use:** This general mutual aid and coordination mutual aid channel is known as the **GOLD** channel. It is available to any agency, organization, or individual with a legitimate public safety responsibility, including law enforcement, fire, ambulances, Search and Rescue (SAR) organizations and school buses. **Secondary Use:** For communications between an incident commander and the medical branch leader at a major incident.
TAN 155.3400 MHz	**Primary Use:** This statewide Air-to-Ground coordination communications frequency is reserved for rotary wing (helicopter) or fixed wing (airplane) aircraft with ground response units at emergency scenes. Uses include landing assistance and emergency coordination. It is designated as the **TAN** channel. **Note:** All airborne use of this EMS frequency is restricted to below 5280 feet and 10-watt ERP.
NEON 157.4250 MHz	**Primary Use:** This general mutual aid and coordination mutual aid channel is known as the **NEON** channel. **Note:** EMS Priority during mass-casualty incidents. During a major incident, this frequency is for communications within the Triage Group of a Medical Branch.

Frequency Authorization

EMS frequencies may be licensed for base, base/mobile, or mobile-only use by agencies or organizations qualifying as special emergency entities under FCC §90.35. All recognized emergency medical service providers in Montana qualify. Use is restricted to the classes of communications previously listed in Table 19.

The EMS & Trauma Systems (EMSTS) Section of the Department of Public Health and Human Services, through the Department of Administration, maintains a statewide mobile-only license for frequencies and can authorize mobile use to qualified entities unable to obtain a license themselves.

Part X, "Management and Administration," of this manual contains additional information on frequency use authorization by both license and interagency agreement, as well as contact information for appropriate agencies.

Incident Communications Plans

EMS providers rely heavily on interagency communications. Field responders communicate by radio with public safety officials at incident scenes, with various dispatch centers and with hospitals. EMS led the way in Montana communications interoperability by early adoption of a common interagency plan and standardized use of VHF high-band frequencies many years ago.

The EMS Communications Plan presented in Figure 16 on the next page has developed over time to address needs of EMS providers to communicate among themselves, hospitals and dispatch. Through the use of other mutual aid and common frequencies, inter-discipline (EMS-to-fire; EMS-to-law enforcement, etc.) communications can be equally well provided for. The remainder of this section covers basic interagency operations and two general incident communications plans from an EMS perspective.

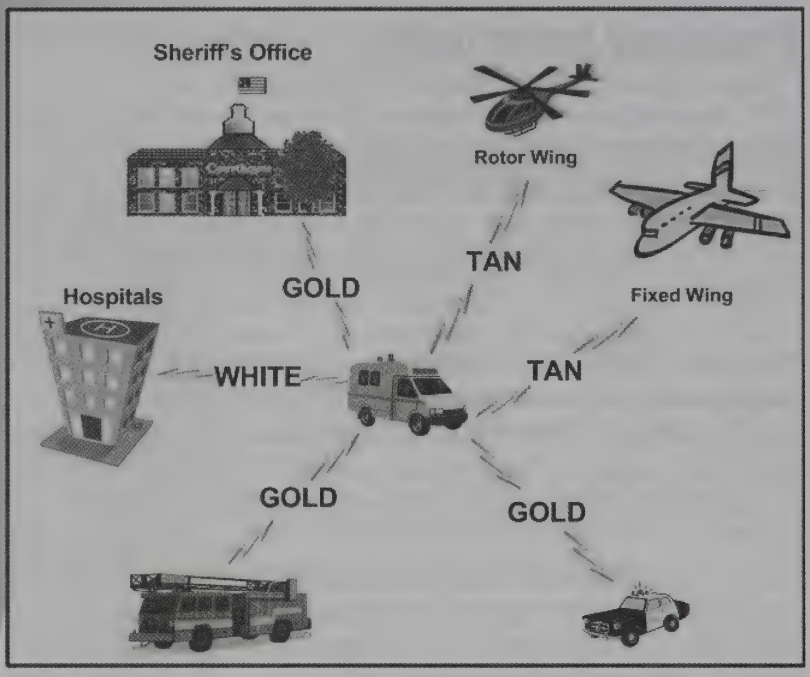


Figure 16

1. Basic Interagency Operations

EMS personnel typically work closely with their local public safety authorities and often have direct communications capabilities through use of local systems (repeaters, dispatch centers, etc.) When outside resources are needed or providers travel outside their own area, communications can be a problem unless mutual aid and common frequencies are used effectively. Their use also can reduce the number of frequencies needed to contact the variety of responders with whom EMS needs to communicate.

Three channels are useful for basic interagency operations:

1. The **GOLD** channel (State Common Mutual Aid) is the primary public safety interagency channel in Montana. It is available to any agency, organization, or individual with a legitimate public safety responsibility.
2. The **WHITE** channel is for Ambulance-to-Hospital and Ambulance-to-Ambulance communications and retains that use from routine emergencies to large incidents.

3. The **TAN** channel is designated as the Statewide Air-to-Ground Coordination reserved for rotary or fixed wing aircraft with ground response units at emergency scenes. Uses include landing assistance and emergency coordination. Secondary use of the TAN channel is for Hospital-to-Ambulance communications or for EMS interagency communications [Ambulance-to-Ambulance, Quick Emergency Unit (QRU), etc.] during larger incidents.

2. Small-Scale Incidents

Figure 17 shows a communications plan that could be used during a small-scale incident organized under ICS. The incident commander could use **GOLD** to manage multi-discipline resources. While the **GOLD** channel may be used between EMS units, care should be taken not to overload **GOLD** since it is the only mutual aid channel established for use between different public safety services. Typically, medical commands use **GOLD** for staging and a local channel for tactical purposes. The **TAN** channel provides a link between all emergency responders.

The vast majority of Montana interagency incidents could be handled with this simple communications plan.

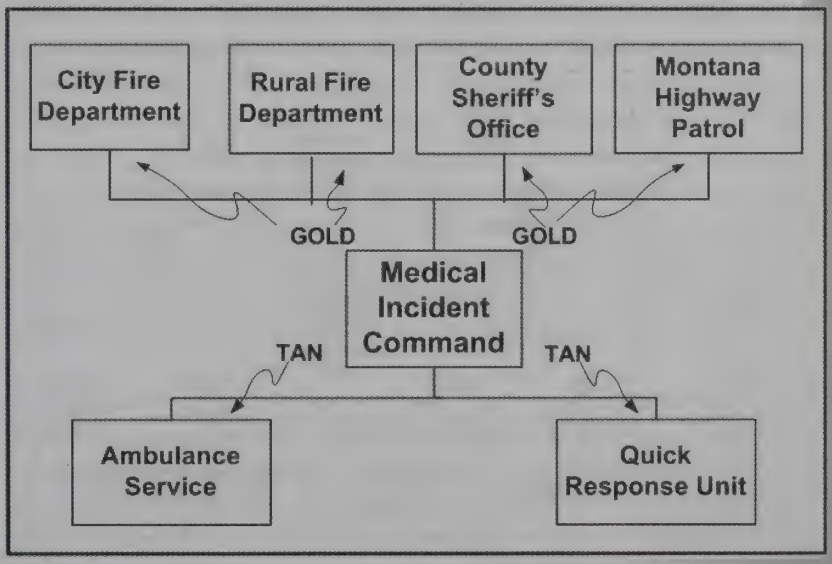


Figure 17

3. Extended Incidents

Mass-casualty incidents bring tremendous demands for communications interoperability. EMS, fire and law enforcement resources are usually called upon when they occur, and each response group brings its own unique communications needs. The plan depicted in Figure 18 focuses on the EMS side of such operations, with command span-of-control and organizational structure abbreviated for the sake of clarity. Additional subdivisions may be assumed to exist below unexpanded sections, branches, divisions, groups and task forces.

The **GOLD** channel is the primary means of radio communication between different public safety service types. In this example, it is used by the Medical Incident Commander to direct various types of resources (fire, EMS, law enforcement, etc.) that respond.

EMS units under an ICS communications plan would use **TAN** for medical staging of air and ground units. **NEON** becomes an EMS Priority during a mass-casualty incident. In this instance, **NEON** is used for communications within the Triage Group of a Medical Branch.

GRAY is used for communications within the Treatment Group of the Medical Branch while the **PINK** channel is used for communications within the Transport Group of the Medical Branch.

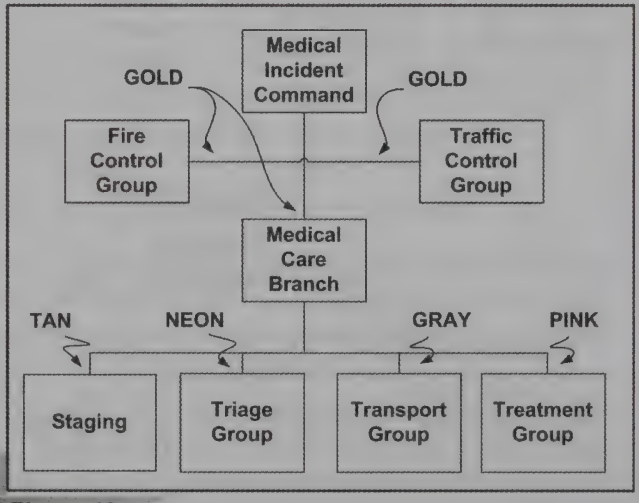


Figure 18

Part VII: Disaster and Emergency Services (DES)

Introduction

State and local Disaster and Emergency Services (DES) offices play a critical role in Montana's emergency response efforts. In times of emergencies, the preservation of life and property depends on a swift and coordinated response of both personnel and resources. The ability to communicate is a key factor in managing response efforts. Montana DES utilizes the **BROWN** frequency for coordination and control of communications with deployed resources.

The effectiveness of any government's emergency response efforts often depends on comprehensive integrated communications capabilities. In recognition of this fact, DES has acquired state-of-the-art communications technology, including mobile radios, a cache of portable radios, tactical repeaters, and interoperable equipment. These assets are intended for statewide use during emergencies, disasters and/or incidents for the purpose of supporting local, tribal, other state agencies as well as federal entities. This equipment permits interoperability through VOIP, ROIP, satellite, landlines, cell phones as well as simplex, and duplex radio systems that re-transmit the signal.

DES is working with other entities, such as the National Guard and the Interoperability Montana Project, to interface with their communications systems. A reliable, sophisticated communications system is of utmost importance, for not only major disasters, but also for day-to-day public safety needs.

Purpose

To meet emergency response needs, a statewide common frequency was created for interagency direction and control communications during disaster or emergency situations. It is named the DES Direction and Control Frequency and is referred to as the **BROWN** frequency. The frequency is 155.8200 MHz, and was established in accordance with Federal Communications Commission (FCC) Rules and Regulations, Part 90 and MCA §2-17-542.

Usage

The Montana DES Direction and Control Frequency, or **BROWN** channel, is established exclusively for these purposes:

- Emergency management communications by elected or appointed officials of the executive branch of government, emergency response agency department heads and supervisors, and other department heads who have specific emergency assignments.
- Communications which are essential for direction and control needs during a disaster or emergency situation.
- Extended incident coordination between the Incident Commander, command staff, EOC and high-level command/local government operations.

The **BROWN** channel is available for mobile and/or base licensure directly with the FCC. It is not licensed statewide for access by agreement; so, is not considered a mutual aid channel, proper. **Each agency using the frequency must hold a license authorizing use, and each base station must be specifically listed.** A licensee may issue authorization to another agency for mobile use of the frequency for communications with itself, the licensee.

Utilization of **BROWN** by state, tribal or local agencies outside of agreements is not allowed. Inappropriate use includes using **BROWN** for any of these purposes:

- Fire tactical channel
- Law enforcement tactical channel
- General use frequency
- Agency talk-around frequency

Such use violates the intent and agreement to use **BROWN** according to standard practices. It also greatly increases the risk of interference and conflict during an emergency.

Eligibility

Specifically, the following entities are eligible to use the DES Direction and Control Frequency within Montana. Additional rules and regulations affecting eligibility may be established by the Montana Department of Administration.

- **State of Montana:** The State of Montana, Department of Administration and the Department of Military Affairs, DES Division, shall be eligible to license the 155.8200 MHz frequency statewide for mobile, temporary fixed base, and temporary fixed mobile relay use for the purposes set forth in this plan. The DES Division shall be eligible to license the frequency for fixed mobile relay use to support operation of the State Emergency Operations Center for the purposes set forth in this plan. The frequency 153.9650 MHz is reserved statewide as the input frequency for these relays and for future expansion of DES communications.
- **Other Government Entities:** Any state agency, county, city, town, or similar governmental entity eligible to hold authorization to operate radio stations under FCC Rules and Regulations, Part 90.17 Local Government Radio Service, is eligible to license the frequency 155.8200 for base and/or mobile use.

State Mutual Aid and Common Frequencies

Good, reliable radio communication is essential not only for major disasters, but also for day-to-day public safety needs. In addition to the **155.8200 MHz - BROWN - State DES Direction and Control** frequency, Montana's disaster and emergency management officials can make good use of these other VHF-high band public safety frequencies in carrying out their responsibilities: **GOLD, TAN** and **NEON**. Their use is summarized in Table 22 on the following page.

Table 22: Montana Mutual Aid Common (DES) and General Use Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
155.8200	**BROWN**	None	State DES Direction and Control	• Exclusively for emergency management communications for direction and control needs during a disaster or emergency situation. • Use only per SOP or State DES approval
153.9050	**GOLD**	None	General Mutual Aid and Coordination	
155.3400	**TAN**	VMED28	**Primary Use**: State Air-to-Ground Coordination **Secondary Uses:** EMS communications and medical staging at an incident scene.	10-Watt Airborne Limit restricted to under 5280 feet
157.4250	**NEON***	None	General Mutual Aid and Coordination	• Narrowband Only • 40-Watt Mobile Limit • Use above Line A requires special FCC approval through the Dept. of Administration
			• *Not available within 120 Km of Coutts, AB including the following jurisdictions: the Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties.* • *Not available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties as well as the Fort Peck Reservation due to co-channel use.*	

* ***NEW*** General Mutual Aid Simplex Frequency

Since all public safety providers may use the General Use Mutual Aid frequencies, they are valuable to emergency managers who may need to contact a wide variety of responders. Base stations with local-area coverage can be particularly valuable in support of an Emergency Operations Center (EOC). Part II of this manual contains additional information on using the **GOLD** channel in base stations.

Licensing Frequencies

The **BROWN, GOLD, TAN,** and **NEON** frequencies are in the FCC Local Government Radio Service. The FCC has designated the Association of Public-Safety Communications Officials (APCO) as the coordinator for this service. Applications for license are submitted to the APCO Automated Frequency Coordination office for processing before being sent to the FCC.

APCO uses local advisors in each state for much of the actual coordination work. The Montana Frequency Advisory Committee (MFAC) of the state APCO chapter approves applications forwarded to it from the national APCO office. MFAC also considers applications through a "pre-approval" process whereby it and the applicant are able to look for agreeable solutions to communications needs. Part X, "Management and Administration," covers details of obtaining authorization on Montana's mutual aid and common frequencies.

Part VIII: Search and Rescue (SAR) Organizations

Introduction

Search and Rescue (SAR) organizations provide trained emergency response to find and recover people who are in distress or imminent danger. Under Montana law, sheriffs are responsible for the provision of search and rescue services within their respective counties. Most sheriffs' departments in the state pass along a large share of this responsibility to private groups of volunteers. These—often non-profit groups— provide a variety of services, including tracking, water rescue, medical support, and evacuation. For more information about Montana SAR organizations, visit this website:

http://www.montanasearchandrescue.org

SAR organizations rely a great deal on radio communications in rendering their life-saving skills. Often they make use of the sheriffs' radio system and many hold their own licenses in the FCC Special Emergency Radio Service.

Purpose

To meet the needs of SAR organizations, statewide SAR common frequencies have been established for interagency emergency communications within Montana. The frequencies 155.1600 (**VIOLET**) and 155.2200 (**PURPLE**) MHz are so established by authority of Montana Codes Annotated §2-17-542 and in accordance with Federal Communications Commission (FCC) Rules and Regulations, Part 90.

Eligibility

The following entities are eligible to use SAR common frequencies within Montana. Additional rules and regulations affecting eligibility may be established by the Department of Administration in consultation with the General Frequency Oversight Advisory Council.

- **Search and Rescue (SAR) Organizations**: Persons or organizations eligible to hold radio station authorization under FCC §90.37, to wit, those operating a rescue squad, are eligible to use Montana SAR common frequencies. Lost-person search units are considered rescue squads for purposes of definition under this plan and interpretation of FCC rules. Licensure on 155.160 (**VIOLET**) or 155.220 (**PURPLE**) MHz shall not affect the eligibility of an organization for further Special Emergency Radio Service frequencies under FCC §90.37(b).

- **Bases**: Any SAR organization in the state meeting the above conditions shall be eligible to obtain base station authorization from the FCC on the frequencies 155.1600 (**VIOLET**) and 155.2200 (**PURPLE**) MHz, subject to applicable FCC Rules and Regulations.

- **Mobile**: Any SAR organization in the state meeting the above conditions shall be eligible to obtain mobile-only authorization from the FCC on the frequencies 155.1600 (**VIOLET**) and 155.2200 (**PURPLE**) MHz or include mobile authorization under a base station license, subject to applicable FCC Rules and Regulations.

Usage

The Montana SAR common frequencies are established primarily for interagency SAR communications. Intra-agency use is allowed on a secondary basis when it does not interfere with interagency communications.

SAR groups may use up to five (5) mutual aid and common frequencies for communicating with other responders. They are listed in Table 23 on the following page.

Table 23: Mutual Aid & Common Search and Rescue Frequencies

Frequency (MHz)	Montana Name	National Designation	Usage	Restrictions/ Notes
153.9050	**GOLD**	None	General Mutual Aid and Coordination	
155.1600	**VIOLET**	None	National Search and Rescue	SAR Coordination Only
155.2200	**PURPLE**	None	State Search and Rescue	SAR Coordination Only
155.3400	**TAN**	VMED28	**Primary Use**: State Air-to-Ground Coordination **Secondary Uses:** EMS communications and medical staging at an incident scene.	10-Watt Airborne Limit restricted to under 5280 feet
157.4250	**NEON***	None	General Mutual Aid and Coordination	• Narrowband Only • 40-Watt Mobile Limit • Use above Line A requires special FCC approval through the Dept. of Administration
			• *Not available within 120 Km of Coutts, AB including the following jurisdictions: the Blackfeet Reservation, Glacier, Liberty, Pondera, and Toole Counties.* • *Not available in: Daniels, McCone, Richland, Roosevelt, and Valley Counties as well as the Fort Peck Reservation.*	

* ***NEW*** General Mutual Aid Simplex Frequency

SAR groups are eligible to enter into agreement with the State of Montana, Department of Administration, for use of the **GOLD** channel for communications with public safety radio users other than search and rescue. The **VIOLET** and **PURPLE** channels may be licensed directly with the FCC for communications with other SAR users. They are discussed below.

Some SAR groups may be eligible for authorization by license or agreement to use EMS, fire, or law enforcement frequencies depending on their particular responsibilities. Generally speaking, though, they are limited by FCC definitions of eligibility for those services.

Common Frequency Use

As was mentioned in the first section of this manual, common frequencies are distinguished from mutual aid by the fact that the latter are licensed statewide by the State of Montana which then provides access by agreement. Common frequencies are available for licensing by each organization. Users must either be licensed for the common frequency or have an agreement with a license holder authorizing communications on the frequency. SAR groups interested in using either the **PURPLE** or **VIOLET** channels are best advised to have their own license.

Note: At the time of publication, PSSB was in the process of seeking statewide licenses for **PURPLE** and **VIOLET**. Updates will be posted at **http://pssb.mt.gov/default.mcpx**.

State Search and Rescue

The frequency 155.2200 (**PURPLE**) MHz has been recognized for several years as the primary common channel for communications between SAR groups in Montana. When it doesn't interfere with interagency communications, it may be used by a group for communications between its own responders. The section on incident communications plans below suggests some appropriate uses of this channel.

Paging and the use of tone-coded squelch are strongly discouraged on this channel as well as on ALL mutual aid and common channels.

National Search and Rescue

In the early 1970s, the National Association of Search and Rescue officially promoted the use of 155.1600 MHz as the nationwide SAR

frequency. The 2009 U.S. Homeland Security's *National Interoperability Field Operations Guide* points out that this frequency is licensed to many SAR organizations, and it encourages public safety entities to obtain licenses for this frequency to facilitate interoperability. In Montana, it may be used for communications between units of a licensee when such use doesn't interfere with interagency communications. Paging and the use of tone-coded squelch are strongly discouraged on this as well as all mutual aid and common channels.

Law Enforcement Frequency Use by Agreement

Search and rescue groups may wish to obtain agreements from law enforcement agencies they work with allowing access to the latter's frequencies. FCC rules allow such agreements where a licensee can consider an outside unit as one of its own for communications with it, the licensee. Law enforcement agencies commonly do this to allow a degree of communications interoperability with those with whom they regularly need to work.

Access by agreement is left entirely to the discretion of the licensee. Agreements are not always the best answer to communications interoperability between individual organizations, especially where mutual aid radio is well established.

Licensing Frequencies

Provisions for SAR organization frequency, base station and radio use are specified under FCC Rule §90.20, "Public Safety Pool". Who is eligible to operate in the Public Safety Pool? Briefly, applicants who were eligible in any of the former Public Safety Radio Services or the former Special Emergency Radio Service are eligible for licensing on channels in the Public Safety Pool.

Non-governmental entities, however, must obtain a letter of consent from the governmental entity having legal jurisdiction over the area to be served if they intend to operate on any channel that was not previously available to the former Special Emergency Radio Service.

Here is the pertinent FCC language:

> §90.20 (a) *Eligibility*. The following are eligible to hold authorizations in the Public Safety Pool. (2) Persons or organizations other than governmental entities are eligible to hold authorizations in the Public Safety Pool to operate radio stations for transmission of communications, as listed below. When requesting frequencies not designated by a "PS"* in the coordinator column of the frequency table in paragraph (c)(3) of this section, applications must be accompanied by a statement from the governmental entity having legal jurisdiction over the area to be served, supporting the request: (iv) Persons or organizations operating a rescue squad for transmission of messages pertaining to the safety of life or property and urgent messages necessary for the rendition of an efficient emergency rescue service.

This section also restricts organizations to one base station, one mobile for each vehicle actually used in operations, and two portables for each radio-equipped vehicle.

Incident Communications Plans

The incident communications plans to be presented here for search and rescue are simple and only intended to suggest uses of the **GOLD**, **VIOLET**, and **PURPLE** channels. The simplest interagency communications plan for a search and rescue incident would use **GOLD**, as depicted in Figure 20 below.

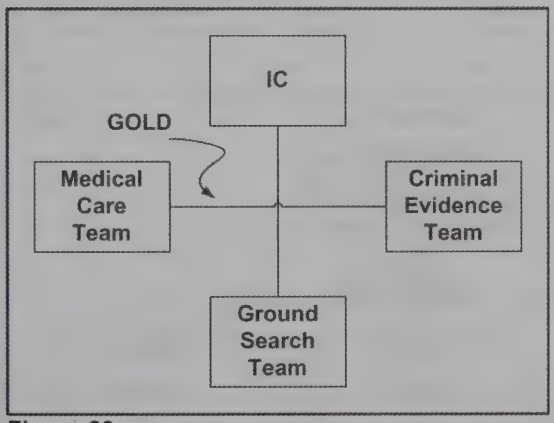


Figure 20

* FCC Rule 90.20(c) lists each frequency in the Public Safety Pool and any required frequency coordinator(s) using letter codes: PS stands for Special Emergency Coordinator.

As the State Common Mutual Aid frequency, **GOLD** is appropriately used at the highest operational level, which includes command in this example, between different public safety disciplines. It would not be appropriately used if only search and rescue groups were involved.

If two or more Montana SAR organizations are involved in an incident, the **PURPLE** channel would most appropriately be used for traffic between them. **GOLD** is still appropriate for higher-level command communications and separate, individually licensed channels may be used or shared at the team level for their coordination.

Figure 21 depicts an interagency search involving other public safety services and hasty teams from different Montana SAR organizations.

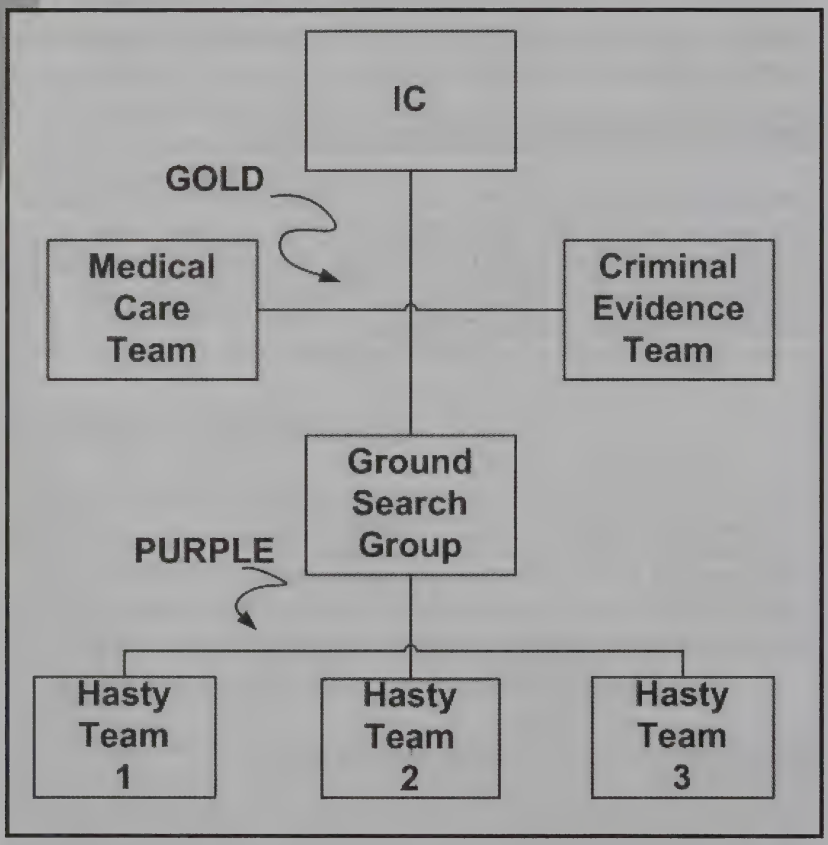


Figure 21

The most complex search and rescue communications plan to be offered here involves multiple Montana SAR teams, resources from outside the state, and other responders. **GOLD** is used at the highest interagency operational level; **PURPLE** is dedicated to communications between Montana SAR teams, and **VIOLET** to resources from outside Montana who would more likely have this frequency than others. Additional frequencies might be used within the teams for their own coordination.

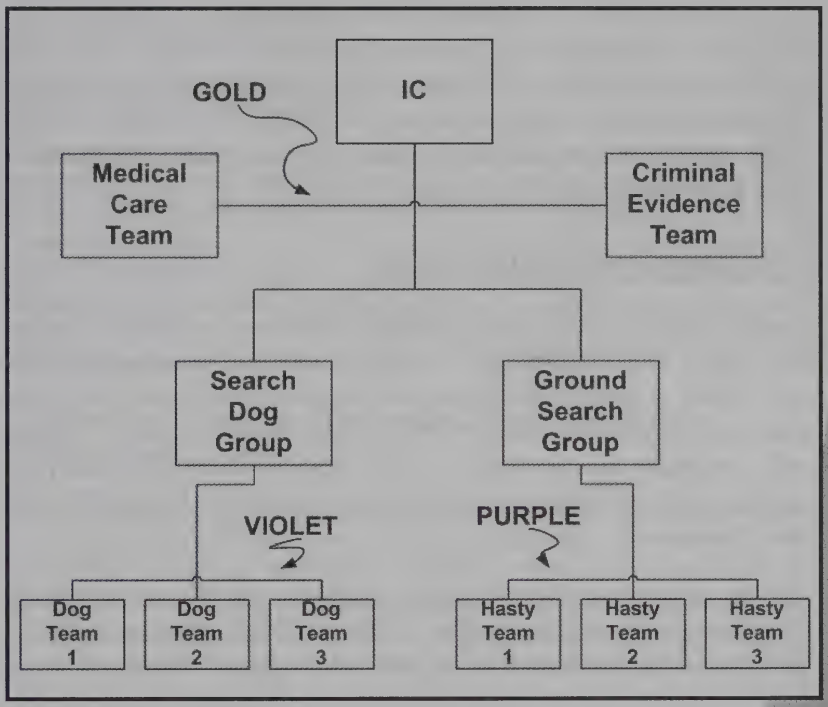


Figure 22

Part IX: Amateur Radio

Introduction

Amateur radio, often called "ham" radio, has a long and distinguished history of volunteer service to public safety. Montana amateur radio operators have provided invaluable service to public safety agencies and are eligible to use mutual aid and common frequencies while formally doing so. In addition, their own special voice, data, and video communications abilities can add tremendous depth and breadth to incident response.

The Amateur's Authority

Amateur radio operators are individually licensed by the FCC under authority of 47 CFR, Part 97. The term "amateur" does not imply a lack of skill or quality, but rather that amateur radio operators work outside of an official, governmental or commercial capacity. In fact, radio amateurs are prohibited by law from accepting monetary or material compensation of any kind for any activities they perform as radio operators.

The Radio Amateur Civil Emergency Service (RACES) is a standby radio service provided for in Part 97.407 of FCC rules and regulations governing amateur radio in the United States. For more information about RACES, visit its website at: **http://www.usraces.org/.**

The American Radio Relay League (ARRL), a non-profit organization, is the largest membership association of amateur radio enthusiasts in the USA. Its website is **http://www.arrl.org/**. The ARRL and the Radio Amateurs of Canada (**http://www.rac.ca/**) sponsor the Amateur Radio Emergency Service (ARES), a corps of trained amateur radio operator volunteers organized to assist in public service and emergency communications. These licensed operators have voluntarily registered their qualifications and equipment for communications duty in service of the public when disaster strikes. State and local coordinators are available to help explain their groups' capabilities. DES officials often can direct interested parties to responsible individuals.

Purpose

To meet the needs of amateur radio organizations, simplex frequencies have been established. The frequencies 146.5200, 146.5400 and 446.000 MHz are all simplex frequencies with no receiver tones. The Montana emergency repeater pair set aside is 145.4700 MHz – (Note the minus offset shown as a minus sign [-] behind it; it does not have a PL tone.) The statewide ARES rally frequency is 3.880 MHz, a High Frequency (HF) radio frequency. The statewide RACES rally HF frequency is 3.947 MHz.

The Amateur's Role

Several likely roles are open to amateur operators in emergency response. ARES and RACES members can provide supplemental local area, point-to-point, and long distance communications. They have been incorporated into state and local disaster communications plans, but may also be of assistance during lesser emergencies. While not an exhaustive list, the potential functions below are offered along with where they may fall in an Incident Command System (ICS) structure:

- **Field or Weather Observer - Situation Unit, Planning Section:**

  Observers are used to feed incident information to the command post for planning purposes. Though generally given specific and narrow responsibilities as an incident progresses, observers may be pre-designated or organized during emergency preparedness planning. In the latter role they may provide the initial information which gives managers a clear picture of the incident's scope. Large-scale emergencies and disasters often disrupt normal lines of communications, further complicating situation assessment.

  Information from observers may be channeled into the incident response in several ways. Reports from observers may be made directly to the Incident Communications Center (ICC) and relayed from there to the ultimate receiver. A more direct route may be preferable, though, particularly if the ICC is heavily involved with command or tactical traffic, which it usually is early in an incident.

  Alternately, amateurs may report to a Network Control Station (NCS) [see the next page] outside the command post, which then relays reports to the Situation Unit. The network control station is ideally located at the command post for the most direct information flow, but the physical site may not be ideal for communicating with wide ranging resources.

However observer communicators are utilized, channeled, observer communications will most likely be done via voice. Preplanning should give priority to mobile, lightly equipped resources in most cases.

- **Network Control Station:**

  The Network Control Station (NCS) is an amateur radio construct and has no direct analogue under ICS structure. For hams, the net control station maintains communications discipline and acts as the hub for a number of stations/operators. In the hierarchical structure of ICS, a "net" hub is either the Incident Communications Center, located at the Command Post, or simply the supervisory end of any communications path. For example, the NCS may be a radio operator assigned to the Situation Unit Leader in the Planning Section who is directly receiving observer reports from along a flooding river.

  Hams are well advised to remember that NCS are not commonly recognized in routine public safety communications, so the term may be meaningless to professionals in the field. With a firm understanding of ICS, amateur radio operators can effectively conduct a traditional net while recognizing it may have a different control station name or expanded functional responsibilities under ICS.

- **Incident Dispatcher - Communications Unit, Logistics Section:**

  One or more incident dispatchers staff the Incident Communications Center (ICC) and are typically activated early in an incident. The term "dispatcher" does not adequately describe all the communications functions of this position, which includes passing messages internal and external to the incident and maintaining logs of certain occurrences.

  Amateur operators may serve as incident dispatchers in several ways. Appropriately trained, they may serve in a general capacity using regular public safety communications facilities. They may serve as the de facto network control station for other amateurs passing operational, planning, or logistics traffic. Or they may be the packet (data radio) operator for an equally wide variety of communications types.

  An incident dispatcher may be the initiator or recipient of "health and welfare traffic", a traditional amateur radio role in times of disaster. A dispatcher may logically be the point of contact between the outside world and the incident for information about victims and near-victims. Many modes of communications are used to carry such traffic, and hams diligently

exercise their National Traffic System on a day-to-day basis. They take special precautions to assure the original message is delivered verbatim.

- **Communications Assistant - Communications Unit, Logistics Section:**

  A person in this position provides assistance away from the ICC, typically at one of the other ICS fixed facilities: base camp, a helicopter base or landing spot, or spike camp. In a disaster, spike camps may be organized at triage sites, victim shelters, or aid stations. The communications assistant is effectively the Communication Unit's "field staff", coordinating with camp managers to see that needs are met.

  Similarly, assistants may be assigned to the incident commander, his or her general staff, or to command staff (such as section chiefs, information officer, safety officer, and liaison officer). In this instance, the communications assistant serves much as does a radio-telephone operator in the military: a personal and technical resource to persons with heavy communications needs. This is an ideal function for properly trained hams.

- **Communications Technician - Communications Unit, Logistics Section:**

  Even during small incidents, the need for communications technicians becomes readily apparent. Qualified persons are needed for setting up the Incident Communications Center, bringing telephone access to the Command Post, installing remote radio facilities, and testing equipment prior to fielding it. Amateur radio operators may be a valuable resource in this area. Often, professional technicians are licensed amateurs whose vocation and avocations are inseparable and who may be invaluable in making an incident communications system work.

All told, hams offer a tremendous range of skills and capabilities — ones which make them valued members of an incident response. With appropriate training in ICS and public safety communications as it is practiced in a jurisdiction, amateur radio operators have a great deal to offer.

Part X: Management and Administration

Introduction

Montana Codes Annotated §2-17-542 gives the Department of Administration responsibility for developing policies and procedures for management of mutual aid frequencies. Frequency utilization plans for all mutual aid and most common frequencies have been developed by the Department of Administration and are incorporated throughout this manual.

The Department of Administration holds statewide licenses for the 22 mutual aid, general use and common frequencies identified in this manual. They are held to allow other eligible users access to the frequencies by agreement. This access allows users to communicate with each other, not just with the license holder. This distinguishes mutual aid frequencies as implemented in Montana from all other radio frequencies.

Authority to transmit on a radio frequency comes either through interagency agreement with a license holder or from direct license (with the FCC, in the case of state and local public safety). Generally speaking, access by agreement allows only communications with the license holder.

The following sections cover details of interagency agreements, licensing mutual aid base stations and common frequencies, and contacts for matters involving these frequencies.

Interagency Agreements

Mutual aid agreements for radio sharing and otherwise reflect the critical dependence public entities have on one another. When made for shared access to radio frequencies and systems, these agreements can provide the communications interoperability essential to coordinated public safety response.

1. Locally Licensed Frequencies

The holder of a radio license with mobile authority can issue agreements authorizing use of the frequency by mobile units of other agencies for communications with itself, the license holder. The licensee essentially considers the other units as its own for those communications. The non-licensed user is bound by all restrictions of the license such as power output and range of operation. The license holder may establish additional restrictions as conditions of the agreement.

It should be understood that the license to operate on a given frequency does not necessarily give the license holder authority to communicate on the frequency with other licensees. This is referred to as inter-systems use and is restricted by the FCC. Mutual aid and common frequencies are intended primarily for such use. Standard agreements between individual agencies give outside units access to a system for communications with the license holder. Access is limited to mobile (including portable) transmitters.

2. State-of-Montana Licensed Frequencies

Mutual Aid Frequencies: The Department of Administration State of Montana licenses 3 general use frequencies, 3 law enforcement frequencies, 9 fire frequencies and 3 EMS mutual aid frequencies. These are provided in Tables 1-4 in Part II, Channels and Base Stations, of this manual.

These frequencies are managed by the Department of Administration, State Information Technology Services Division, Public Safety Services Bureau (PSSB). PSSB issues access agreements, coordinates policy, and addresses abuse problems. Mutual Aid access applications may be submitted electronically at:

https://app.mt.gov/mutualaid/

Updates to this *Mutual Aid and Common Frequencies Manual* are posted on the PSSB website, which is located at:

http://pssb.mt.gov/default.mcpx

Mobile access by agreement to EMS frequencies is provided through joint arrangement between the Department of Administration and the Department of Public Health and Human Services, EMS & Trauma Systems (EMSTS) Section. The EMSTS Section maintains statewide EMS licenses and oversees the EMS Communications Plan.

Table 24: PSSB & DPHHS Contact Information

Public Safety Services Bureau (PSSB)	Dept. of Public Health and Human Services (DPHHS)
SITSD - Department of Administration	EMS & Trauma Systems Section
125 N. Roberts	1400 Broadway
Mitchell Building – Room 52	Cogswell Building - Room C317
Helena, MT 59620	Helena, MT 59620
Phone: 406-444-2092	Phone: 406-444-3895
Fax: 406-444-0165	Fax: 406-444-1814
pssbinfo@mt.gov	emsinfo@mt.gov

Common Frequencies: As was mentioned previously in this manual, common frequencies are distinguished from mutual aid by the fact that the latter are licensed statewide by the State of Montana which then provides access by agreement. Common frequencies are available for licensing by each organization. Users must either be licensed for the common frequency or have an agreement authorizing communications on the frequency with a license holder, from the license holder. The four identified in his manual are:

- 155.8200 MHz **BROWN** State DES Direction and Control
- 155.1600 **VIOLET** National Search and Rescue
- 155.2200 **PURPLE** State Search and Rescue
- 171.4750 **GREEN** State/Federal Common

The Disaster and Emergency Services Division of the Department of Military Affairs maintains a statewide mobile and Helena base station license on the **BROWN** channel. **BROWN** is an FCC Local Government frequency coordinated by the Association of Public-Safety Communications Officials (APCO). Applications for license are submitted through that organization, whose contact information is provided in the section entitled "Frequency Coordination."

Table 25: DES Contact Information

Montana Disaster and Emergency Services (DES) Division
P.O. Box 4789; 1956 Mt. Majo Street
Helena, MT 59636-4789
Phone: 406-324-4777
FAX: 406-324-4790
mtdes@mt.gov

Search and Rescue (SAR) groups interested in using either the **VIOLET or PURPLE** channels are advised to have their own license. The **VIOLET** and **PURPLE** channels may be licensed directly with the FCC for communications with other SAR users. **VIOLET** is an FCC Special Emergency Radio Service frequency coordinated by the National Association of Business and Educational Radio (NABER). Contact information for this organization is provided in the "Frequency Coordination" section.

3. Other Statewide Licensed Frequencies

Other statewide licensed frequencies include common frequencies that are either licensed by the user or accessed by agreement with a licensee specifically for communications with that licensee. The **GREEN** channel is the only one that is available through an agreement.

Montana response organizations do not have automatic permission to utilize **GREEN** and must follow required processes to obtain that permission. Contrary to popular belief that the **GREEN** (171.4750 MHz) channel is held by the United Stated Forest Service (USFS), the **GREEN** channel is actually a National Telecommunications and Information Administration (NTIA) common frequency that may be licensed by any state or federal agency. FCC CFR Part 90.20 states that the frequency may be "licensed by state forestry and conservation agencies and any others requiring access to the state (radio) system."

Here is the contact information for agencies wanting to submit an access application to license the **GREEN** channel:

Table 26: USFS Contact Information

USDA Forest Service
Mr. Kary Mavencamp*
Regional Frequency Coordinator
Emmett Road, 1805 Highway 16 #5
Emmett, ID 83617
Office: 208-365-7027
Cell: 208-369-0423
Fax: 208-365-7036
kmavencamp@fs.fed.us

Radio Licensing for Mutual Aid Fixed Stations

Montana mutual aid and common frequencies may be licensed by individual agencies under certain conditions. The Department of Administration allows fixed base stations on some mutual aid frequencies. The **GOLD** and **SILVER** frequencies may be licensed for base station use with the FCC through an appropriate public safety frequency coordinator.

The **RUBY** frequency can be licensed for permanent mutual aid repeaters which use **GARNET** as the input or mobile transmit frequency. Authorization to use **GARNET** in mobiles or temporary control stations is only available through agreement with the Department of Administration.

The **BLUE** frequency is available for installation in base stations, but all authorization is done through State of Montana licenses. The Department of Administration authorizes the base stations, then licenses them permanently under the State of Montana Federal Registry Number (FRN).

* As of May, 2011

WHITE, **TAN**, **GRAY**, and **PINK** are all intended primarily for base-mobile communications. They are Emergency Medical Service radio frequencies and are coordinated and licensed with the FCC through the International Municipal Signal Association/International Association of Fire Chiefs (IMSA/IAFC). Applications for license are submitted through that organization. Contact information for this organization is provided in the next section.

Frequency Coordination

Public safety frequencies — including Montana mutual aid and common frequencies — are handled by designated frequency coordinators. Frequencies must go through coordination prior to FCC approval. Frequency coordination agencies for frequencies below 512 MHz are listed below for reference.

Table 27: Frequency Coordinators Below 512 MHz*

Frequency Designation	Contact Information
For frequencies designated with: **PP** = Police **PX** = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**Association of Public-Safety Communications Officials, Inc. (APCO)** Automated Frequency Coordination Dept. 351 N. Williamson Blvd. Daytona Beach, FL 32114-1112 **Phone:** 888-272-6911 **Fax:** 386-322-2502 **Email:** afc@apcointl.org **Website**: www.apcointl.org/
For frequencies designated with: **PF** = Fire **PM** = Emergency Medical **PX** = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**International Municipal Signal Association (IMSA)** IMSA Frequency Coordination 758 N. Agave Way Ivins, UT 84738 Phone: 401-738-2220 Toll Free: 800-723-IMSA (4672) Fax: 401-738-7336 Email: fireems@imsasafety.org Website: www.imsasafety.org/

* Courtesy of http://www.fcc.gov/pshs/public-safety-spectrum/coord.html

Table 27: Frequency Coordinators Below 512 MHz* *(continued)*

Frequency Designation	Contact Information
For frequencies designated with: **PF** = Fire **PM** = Emergency Medical **PX** = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**International Association of Fire Chiefs (IAFC)** 4025 Fair Ridge Drive, Suite 300 Fairfax, VA 22033-2868 **Phone**: 703-273-0911 **Fax**: 703-273-9363 http://www.iafc.org/ **Note:** The IAFC, in cooperation with the International Municipal Signal Association (IMSA), provides frequency coordination services for the fire, EMS and public safety pool frequencies. Visit www.IMSAsafety.org and click on Frequency Coordination for more information.
For frequencies designated with: **PO** = Forestry-Conservation **PX** = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**Forestry Conservation Communications Association (FCCA)** Attention: John Theimer FCCA National Office 122 Baltimore Street Gettysburg, PA 17325 Phone: 717-338-1505 Fax: 717-334-5656 Email: nfc@fcca-usa.org Website: www.fcca-usa.org/
For frequencies designated with: PH = Highway Maintenance PX = Any Public Safety, except the Special Emergency in Section 90.20 of FCC rules.	**American Association of State Highway and Transportation Officials (AASHTO)** c/o RadioSoft 8900 Dicks Hill Parkway Toccoa, GA 30577 **Phone:** 888-601-3676 **Fax:** 706-754-2745 **Email:** angela@radiosoft.com; kathigit@radiosoft.com **Website**: www.aashto.org

* Courtesy of http://www.fcc.gov/pshs/public-safety-spectrum/coord.html

Table 27: Frequency Coordinators Below 512 MHz* *(continued)*

Frequency Designation	Contact Information
For frequencies designated with: **PS** = Special Emergency in Section 90.20 of FCC rules.	**Enterprise Wireless Alliance (EWA)** Attn: Frequency Coordination Dept. 8484 Westpark Drive, Suite 630 McLean, VA 22102 **Phone:** 703-528-5115 **Fax:** 703-524-1074 **Email:** ila.dudley@enterprisewireless.org **Website**: www.ita-relay.com/
	Forest Industries Telecommunications (FIT) 1565 Oak Street Eugene, Oregon 97401 **Phone:** 541-485-8441 **Fax:** 541-485-7556 **Email:** license@landmobile.com **Website**: www.landmobile.com
	Manufacturers Radio Frequency Advisory Committee, Inc. (MRFAC) 899-A Harrison St., S.E. Leesburg, VA 20175 **Phone:** 703-669-0320 **Fax:** 703-669-0322 **Email:** info@mrfac.com, MRFACFreq@aol.com **Website**: www.mrfac.com/
	PCIA/IAFC/IMSA Attn: Frequency Coordination Department 901 N. Washington St., Suite 600 Alexandria, Virginia 22314-1561 **Phone:** 703-535-7502 **Fax:** 703-836-1608 **Email:** andrewd@pcia.com **Website:** http://www.pcia.com/ **Website:** http://www.imsasafety.org/

* Courtesy of http://www.fcc.gov/pshs/public-safety-spectrum/coord.html

Table 27: Frequency Coordinators Below 512 MHz* *(continued)*

Frequency Designation	Contact Information
For frequencies designated with: **PS** = Special Emergency in Section 90.20 of FCC rules.	**Utilities Telecom Council** 1129 20th Street NW, Suite 350 Washington, DC 20036 **Phone:** 202-872-0030 **Fax:** 202-872-1331 **Email:** spectrumservices@utc.org **Website**: http://www.utc.org/

Frequency Resources

Table 28 presents a list of three other frequency resource organizations.

Table 28: Frequency Resource Organizations

Purpose	Contact Information
Responsible for licensing and policing all state and local public safety frequencies. The FCC-designated frequency coordination organizations are generally the first point of contact for someone wishing to license a radio frequency. Each charges a coordination fee for its services in addition to collecting applicable FCC fees.	**Federal Communications Commission (FCC)** 445 12th Street, SW Washington, DC 20554 **Phone:** (202) 632-6940 **Toll Free Voice**: 888-CALL FCC (888-225-5322) **Toll Free Fax**: 866-418-0232 http://www.fcc.gov/ **FCC Rules and Regulations** (Title 47, Code of Federal Regulations, Parts 0-199) http://wireless.fcc.gov/rules.html

* Courtesy of http://www.fcc.gov/pshs/public-safety-spectrum/coord.html

Table 28: Frequency Resource Organizations *(continued)*

Purpose	Contact Information
The Interdepartment Radio Advisory Committee (IRAC) is responsible for managing federal radio frequencies. It functions under the National Telecommunications Information Administration (NTIA) of the U.S. Department of Commerce. While state and local agencies are not eligible for authorization in the federal spectrum, IRAC and the NTIA may be able to provide valuable information for shared operations or interference problems.	**Interdepartment Radio Advisory Committee (IRAC)** U.S. Department of Commerce/NTIA Herbert C. Hoover Building (HCHB) 1401 Constitution Avenue, N.W. Washington, D.C. 20230 Phone: 202-482-2000 http://www.ntia.doc.gov/ **NTIA Rules and Regulations** (Title 47, Code of Federal Regulations, Part 300) http://www.ntia.doc.gov/osmhome/redbook/redbook.html
NPSTC is a federation of organizations working to improve public safety communications and interoperability.	**National Public Safety Telecommunications Council (NPSTC)** 8191 Southpark Lane, Suite 205 Littleton, CO 80120 **Toll Free**: (866) 807-4755 **Fax**: (303) 649-1844 **Websites**: http://npstc.org; http://www.niix.org/ **Email:** info@npstc.org, support@npstc.org

National Interoperability Field Operations Guide (NIFOG)

The National Interoperability Field Operations Guide (NIFOG) is a technical reference not only for radio technicians responsible for radios that are to be used in disaster response applications, but also for emergency communications planners. The NIFOG is a useful tool for planners because it provides them with information about interoperability channels most likely to be used in radios of responders from another discipline or jurisdictions.

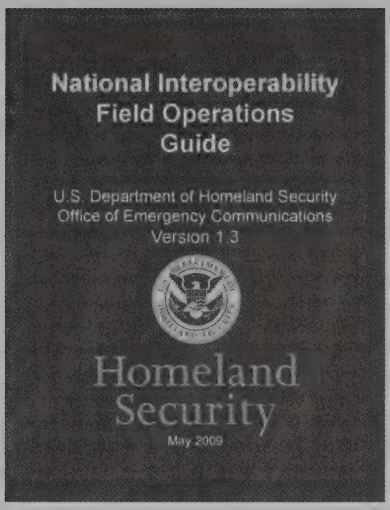
The NIFOG includes rules and regulations for use of nationwide and other interoperability channels, frequencies and channel names, and other reference material. The online version is available at this website:

http://www.safecomprogram.gov/SAFECOM/nifog/

Relevant tables from the NIFOG appear in Appendices A - E of this manual, as follows:

- **Appendix A:** Non-Federal VHF National Interoperability Channels
- **Appendix B:** VHF Incident Response (IR) Federal Interoperability Channels
- **Appendix C:** VHF Law Enforcement (LE) Federal Interoperability Channels
- **Appendix D:** Federal/Non-Federal VHF SAR Operations Interoperability Plan
- **Appendix E:** VHF Public Safety Mutual Aid and Common Channels

The U.S. Dept. of Homeland Security recommends having these channels programmed in radios at all times rather than waiting until a disaster is imminent or occurring to do the programming. A license (for non-Federal radio users) or an authorization (for Federal users) is required only to TRANSMIT on an LMR radio frequency. No license or authorization is required to program the frequencies into radios.



Montana Mutual Aid Oversight Councils

The Department of Administration relies on guidance on mutual aid and common frequencies policy from three steering bodies: the General Frequency Oversight Council, the Law Enforcement Mutual Aid Radio Council, and the Fire Mutual Aid Radio Council. These councils are convened as necessary. Information on representation for the law enforcement and fire oversight councils appears in Parts IV and V of this manual.

The General Frequency Oversight Council has the following membership:

- Law Enforcement Mutual Aid Radio Council Chair
- Fire Mutual Aid Radio Council Chair
- EMS Representative
- APCO's Montana Frequency Advisory Committee Chair Frequency Manager for the Public Safety Services Bureau, SITSD, DOA

Information on the current members of these councils may be obtained from the Public Safety Services Bureau, State Information Technology Services Division, Department of Administration, 406-444-2092, **pssbinfo@mt.gov**.

Part XI: Narrowbanding

Introduction

Jan. 1, 2013 is the deadline for all VHF and UHF public safety and industrial/business Land Mobile Radio (LMR) systems in the 150-174 and 421-512 MHz bands to migrate from 25 kilohertz channel bandwidth to 12.5 kilohertz or narrower technology. This deadline is the result of a Federal Communications Commission (FCC) effort that began almost two decades ago to ensure more efficient use of radio spectrum and greater spectrum access for public safety and non-public safety users.

Public safety agencies need to continue efforts to plan for equipment replacements and/or upgrades, which will include equipment inventories to determine if current equipment can be converted or re-programmed to 12.5 kHz. Any radio that cannot be re-programmed to narrowband operation be will need to be replaced. Agencies also should verify that they have a current, valid FCC Part 90 license, and add narrowband emissions to it.

Timely completion of narrowbanding will ensure more efficient use of spectrum, relieve congestion and result in increased channel availability for LMR systems. After the FCC deadline, licensees not operating at 12.5 KHz efficiency will be in violation of the Commission's rules and may be subject to FCC fines or license suspensions.

Narrowbanding Explained

Most current public safety radio systems use 25 kHz-wide channels. This migration to 12.5 kHz efficiency technology—now referred to as narrowbanding—will allow for the creation of additional channel capacity within the same radio spectrum, and support more users. Radio spectrum is very congested, especially in metropolitan areas. As more agencies migrate to narrowband operation, the pool of available frequencies should increase.

Channelization is the division of a wide-band communications channel into multiple narrow-band channels. The chart in Figure 23 illustrates how the channelization plans for the VHF band is changing as a result of narrowbanding. The top segment of the chart shows the legacy (pre-narrowbanding) configuration of 25 kHz. The middle segment shows the channelization after migration to 12.5 kHz channels. The bottom segment shows the channelization plan for the expected (but not yet mandated) future migration to 6.25 kHz equipment.

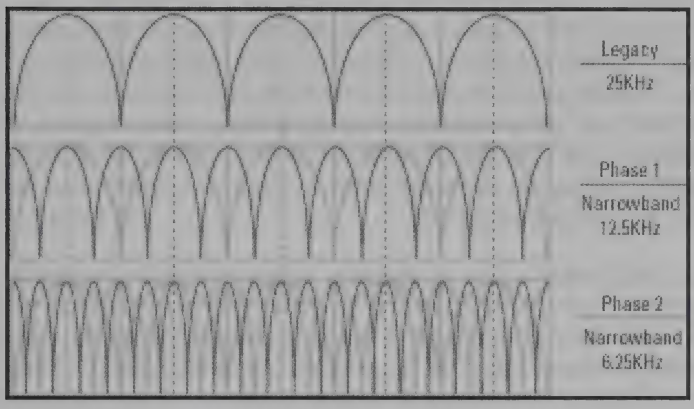


Figure 23

For more information, please visit this website:

www.fcc.gov/narrowbanding

Mutual Aid and Common Frequencies & State Agency Narrowband Migration Date

The Mutual Aid and Common Frequencies & State Agency Narrowband migration date is:

October 1, 2012

Because of the extensive use of VHF voice communication and UHF links by State of Montana agencies, the transition to narrowbanding is a priority. State agencies will be completing their transition to narrowbanding by Oct. 1, 2012.

The transition to narrowbanding of state mutual aid licenses will be completed by Oct. 1, 2012 as well.

Part XII: What is Interoperability?

Overview

Many people assume that emergency response agencies across the nation are already interoperable. In actuality, emergency responders often cannot talk to some of their own jurisdiction agencies — let alone communicate with agencies in neighboring cities, counties, tribes or states or with various federal entities. Montana recognizes that an agency must be operable before it can be interoperable across agencies and jurisdictions.

Radio "operability" allows first responders access to radio communications systems that provide adequate coverage and features to meet their everyday communication requirements while performing basic elements of their jobs. The hope is that "operability" will move toward "interoperability," meaning the ability of two or more organizations to communicate and share information (voice, data, images, and video) on demand and in real time, whenever necessary. It is the term that describes how radio communications systems should operate between and among agencies and jurisdictions that respond to common emergencies.

Communications interoperability serves as a vital tool for public safety professionals, whether they are responding to a major incident, conducting a task force operation, or coordinating responses to daily events. This capability can provide life-saving support and can streamline response coordination efforts under a myriad of circumstances, including incidents that employ emergency responders from multiple agencies or jurisdictions.

Obviously, technology plays a critical role in the achievement of communications interoperability. Equally important, however, is whether or not emergency responders also use interoperable and compatible procedures and training. Seamless communications interoperability will be achieved when emergency response officials can be deployed anywhere in the country, use their own radios to communicate with other responders, and use compatible Standard Operating Procedures (SOPs) that they have been trained on in their respective jurisdictions.

The Interoperability Continuum

The outside back cover of this publication features the SAFECOM Interoperability Continuum. SAFECOM is a Dept. of Homeland Security program that provides research, guidance and tools on communications-related issues. The Interoperability Continuum tool was designed to show core dimensions of success that need to be addressed as interoperable solutions are planned and implemented.

These elements include governance, standard operating procedures, technology (both data and voice aspects), training and exercises, and usage of interoperable communications. To gain a true picture of an area's interoperability, progress along all five elements of the continuum must be considered together. For example, when an agency procures new equipment, that agency should plan training and conduct exercises to learn how to make the best use of that equipment.

Local jurisdictions, regional consortia, and state and tribal agencies may want to use the Interoperability Continuum as a tool to assess their current level of interoperability and to determine what elements need further development. To drive progress along the five elements of the continuum and improve interoperability, emergency response practitioners should observe the following principles:

- Gain leadership commitment from all disciplines (Emergency Medical Services [EMS], Fire, Law Enforcement);
- Foster collaboration across disciplines (EMS, Fire, Law Enforcement) through leadership support;
- Interface with policy makers to gain leadership commitment and resource support;
- Use interoperability solutions on a regular basis;
- Plan and budget for ongoing updates to systems, procedures, and documentation; and
- Ensure collaboration and coordination across all elements (Governance, Standard Operating Procedures, Technology, Training and Exercises, Usage).

For more information, please visit:

http://www.safecomprogram.gov

Appendix A

Non-Federal VHF National Interoperability Channels

Non-Federal VHF National Interoperability Channels			
Description	**NPSTC ID**	**Channel (MHz)**	**CTCSS Tone ±**
VHF Low Band			
Law Enforcement	LLAW1	39.4600	CSQ /156.7 (5A)
Fire (Proposed)	LFIRE2	39.4800	
Law Enforcement	LLAW3	45.8600	
Fire	LFIRE4	45.8800	
VHF			
Calling	VCALL10	155.7525 base/mobile	CSQ /156.7 (5A)
Tactical	VTAC11 *	151.1375 base/mobile	CSQ /156.7 (5A)
Tactical	VTAC12 *	154.4525 base/mobile	CSQ /156.7 (5A)
Tactical	VTAC13	158.7375 base/mobile	CSQ /156.7 (5A)
Tactical	VTAC14	159.4725 base/mobile	CSQ /156.7 (5A)

* VTAC11 and VTAC12 may not be used in PR/VI.

± Default operation should be carrier squelch receive, CTCSS transmit. If the user can enable/disable without reprogramming the radio, the indicated CTCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.

Appendix B

VHF Incident Response (IR) Federal Interoperability Channels

VHF Incident Response (IR) Federal Interoperability Channel Plan				
Assignment (subject to availability & local plans)	**NTIA ID**	**Note**	**Mobile TX (MHz)**	**Mobile RX (MHz)**
Incident Calling	NC 1 Calling	NC 1CALL	164.7125	169.5375
Incident Command 1	IR 1		165.2500	170.0125
Medical Evacuation Control	IR 2		165.9625	170.4125
Logistics Control	IR 3		166.5750	170.6875
Interagency Convoy	IR 4		167.3250	173.0375
Incident Calling (Direct)	IR 5	Direct for NC 1 Calling	169.5375 (S)	169.5375
Incident Command 1 (Direct)	IR 6	Direct for IR 1	170.0125 (S)	170.0125
Medical Evacuation Control (Direct)	IR 7	Direct for IR 2	170.4125 (S)	170.4125
Logistics Control (Direct)	IR 8	Direct for IR 3	170.6875 (S)	170.6875
Interagency Convoy (Direct)	IR 9	Direct for IR 4	173.0375 (S)	173.0375

*See "Conditions for Use of Federal Interoperability Channels" on page 17, 18, and 19.
Default operation should be carrier squelch receive, CTCSS 167.9/CSQ transmit. If the user can enable/disable CTCSS without reprogramming the radio, the indicated CTCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.

Appendix C

VHF Law Enforcement (LE) Federal Interoperability Channel Plan

VHF Law Enforcement (LE) Federal Interoperability Channel Plan					
Description	NTIA ID	Note	Mobile TX (MHz)	Mobile RX (MHz)	CTCSS/ NAC
Calling	LE A	Analog	167.0875 (S)	167.0875	167.9 Tx, CSQ Rx
Tactical	LE 1	Analog	162.0875	167.0875	167.9 Tx, CSQ Rx
Tactical	LE 2		162.2625	167.2500	$68F
Tactical	LE 3		162.8375	167.7500	$68F
Tactical	LE 4		163.2875	168.1125	$68F
Tactical	LE 5	Direct for NC 1 Calling	163.4250	168.4625	$68F
Tactical	LE 6	Direct for LE 2	167.2500 (S)	167.2500	$68F
Tactical	LE 7	Direct for LE 3	167.7500 (S)	167.7500	$68F
Tactical	LE 8	Direct for LE 5	168.1125 (S)	168.1125	$68F
Tactical	LE 9	Direct for LE 5	168.4625 (S)	168.4625	$68F

*See "Conditions for Use of Federal Interoperability Channels" on page 17, 18, and 19.
Default operation should be carrier squelch receive, CTCSS 167.9/CSQ transmit. If the user can enable/disable CTCSS without reprogramming the radio, the indicated CTCSS tone should also be programmed for receive, and the user instructed how and when to enable/disable.

Appendix D

Federal/Non-Federal VHF SAR Operations Interoperability Plan

Federal/Non-Federal VHF SAR Operations Interoperability Plan	
SAR Function	**Frequency (MHz)**
Ground Operations	155.1600 (wideband FM)
Maritime Operations *	157.0500 or 157.1500 (VHF Marine ch.21A or 23A) as specified by USCG Sector Commander
Air Operations – civilian	123.1000 MHz AM (may not be used for tests or exercises)
Air Operations – USCG/ Military	345.0 MHz AM for initial contact only, then move to 282.8 MHz AM or other working channel.
Air rescue assets to air rescue assets (deconfliction)	As charted on standard air chart or MULTICOM 122.850 (south or west sector) & 122.900 MHz (north or east sector), or as specified by FAA. 122.850 may not be used for tests or exercises
Ground-to-Air SAR working channel	157.1750 (VHF Marine channel 82A)
Ground to Maritime SAR working channel	157.0500 21A (23A, 81A, 83A alternates as specified by local USCG Sector Commander)**
Maritime/Air/Ground SAR working channel *	157.1750 83A (21A, 23A, 81A alternates as specified by local USCG Sector Commander)**
EMS / Medical Support	155.3400 (wideband FM)
Hailing* & DISTRESS only- Maritime/Air/Ground	156.8000 VHF Marine channel 16

* Use VHF Marine ch.16 to make contact (30 seconds max.), then move to appropriate working channel as directed by local USCG Sector Commander. Non-maritime use of any VHF Marine channel requires FCC Special Temporary Authority or appropriate license. VHF marine channels use wideband FM. Emission 16K0F3E

** VHF Marine channels: 21A=157.0500 23A=157.1500 81A=157.0750 83A=157.1750 MHz Direction from USCG, FCC, or FAA overrides information in this table. This table does not convey authority to operate.

Appendix E

VHF Public Safety Mutual Aid and Common Channels

VHF Public Safety Mutual Aid and Common Channels				
Channel (MHz)	**Usage**	**Wide-band ID**	**Narrow-band ID**	**Note**
155.1600	Search and Rescue Common	SAR WFM	SAR NFM	Not designated by FCC; availability varies.
154.2650 mobile	Fire Mutual Aid	VFIRE22W	VFIRE22	Not available in Puerto Rico and the Virgin Islands
154.2725	Fire Mutual Aid		VFIRE24	
154.2800 base/mobile	Fire Mutual Aid	VFIRE21W	VFIRE21	
154.2875	VFIRE25			
154.2950 mobile	Fire Mutual Aid	VFIRE23W	VFIRE23	
154.3025	VFIRE26			
155.3400 base/mobile	EMS Mutual Aid	VMED28W	VMED28	May be designated for EMS Mutual Aid.
155.3475			VMED29	May be designated for EMS Mutual Aid.
155.4750 base/mobile	Law Enforcement Mutual Aid	VLAW31W	VLAW31	
155.4825	Law Enforcement Mutual Aid		VLAW32	
Rules for use of these channels are contained in 47 CFR 90.20 and NTIA Manual Section 4.3.11 & 7.3.4.				

Homeland Security

Interoperability Continuum

Governance
Individual Agencies Working Independently
Informal Coordination Between Agencies
Key Multi-Discipline Staff Collaboration on a Regular Basis
Regional Committee Working within a Statewide Communications Interoperability Plan Framework
Standard Operating Procedures
Individual Agency SOPs
Joint SOPs for Planned Events
Joint SOPs for Emergencies
Regional Set of Communications SOPs
National Incident Management System Integrated SOPs
Technology
DATA ELEMENTS
Swap Files
Common Applications
Custom-Interfaced Applications
One-Way Standards-Based Sharing
Two-Way Standards-Based Sharing
VOICE ELEMENTS
Swap Radios
Gateway
Shared Channels
Proprietary Shared System
Standards-Based Shared System
Training & Exercises
General Orientation on Equipment and Applications
Single Agency Tabletop Exercises for Key Field and Support Staff
Multi-Agency Tabletop Exercises for Key Field and Support Staff
Multi-Agency Full Functional Exercises Involving All Staff
Regular Comprehensive Regionwide Training and Exercises
Usage
Planned Events
Localized Emergency Incidents
Regional Incident Management
Daily Use Throughout Region
Limited Leadership, Planning, and Collaboration Among Areas with Minimal Investment in the Sustainability of Systems and Documentation
High Degree of Leadership, Planning, and Collaboration Among Areas with Commitment to and Investment in Sustainability of Systems and Documentation

How to Apply for Mutual Aid Access:

Permission to use Montana Mutual Aid and Common Frequencies requires an approved Mutual Aid and Common Frequencies permit from the State of Montana, Department of Administration. Applications need to be submitted electronically at:

https://app.mt.gov/mutualaid/

Online Copies and Updates:

http://pssb.mt.gov/mutual_aid_manual.mcpx

Narrowband Migration Date:

All users are subject to FCC regulations and standard operating procedures as outlined in the 2011 edition of the *Mutual Aid and Common Frequencies Manual.* All frequency assignments will operate in narrowband emission effective on:

October 1, 2012

A total of 3,000 copies of this public document were published at an estimated cost of $2.17 per copy, for a total cost of $6,510.00, which includes $6,510.00 for printing and $0.00 for distribution.

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